# north of 60

prospectus

## a prospectus for resource and economic development in the yukon and the northwest territories

department of indian affairs and northern development

government of canada

# NORTH OF 60 PROSPECTUS

[G-13]

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REVISION OF PROSPECTUS NORTH OF 60

Since it was first published in 1969 by the Department of Indian Affairs and Northern Development, Prospectus North of 60 has proved to be a useful document in the Department's program of disseminating information about the development of natural resources in the Yukon and Northwest Territories.

In preparing the Prospectus, the Department's Northern Economic Development Branch drew together the basic information which it considered would be of value to persons and organizations with special interests in the North.

The Department has the responsibility of directing the development of resources North of 60, and in order to maintain the Prospectus as a current working document, the contents are periodically updated. In this revision the latest information about development North of 60 has been assembled and this is forwarded to you as a Prospectus holder for the purpose of providing you with the most current information available on resource and economic development in the North.

# AN INTRODUCTION TO CANADA NORTH OF 60

Like the churning waters of an Arctic River released from winter's ice, the natural resources of Canada North of 60 are now being revealed. It is a breathtaking, exciting and challenging sight.

The riches discovered so far are immense. As the turn of the drill, the scoop of the shovel, uncover yet more wealth the full size and value of these resources can only be imagined. To those who have already taken the risks and successfully invested in the development of the region the rewards have been great. Yet Canada North of 60 has barely been touched.

Today, the Canadian north is one of the most inviting regions on earth for the daring, for the entrepreneur looking for challenging enterprises – the international corporation looking for major sources of resource material, the small businessman pioneering a new venture in a northern community, the young and curious, filled with the spirit of adventure inherited from other generations who opened up the North American frontiers of the 18th and 19th centuries.

The frontier opportunities North of 60 are unlimited, no matter what field of endeavor, be it resource development, social improvement, research. For the investor, the northern horizons are vast. Minerals, oil, gas, forests, water, land, these are the great potentials. All forms of transportation are open for expansion. The service industries to meet the local needs of the major enterprises – supply houses, hotels, restaurants, entertainment, recreation – are in ever increasing demand.

The Government of Canada has opened the door to its northern regions. It invites the potential investor, the potential citizen of the North to come in and look at the possibilities.

The world's newest frontier begins at the 60th parallel, a line of latitude marking the boundary of the Yukon and the Northwest Territories and the provinces of British Columbia, Alberta, Saskatchewan and Manitoba.

It is a hard frontier, a land of great extremes, tremendous distances and harsh climate. The Yukon Territory covers an area of 205,300 square miles. It is a rugged country, of great mountain peaks, deep valleys and gushing streams. The Northwest Territories, covering 1,253,000 square miles, is a land of mighty rivers, lonely barrens, innumerable lakes and gigantic islands locked in ice.

Canada North of 60 has for centuries been a land of mystery and romance. But in the last decade, as the lid of this great treasure chest is lifted, a new face of the North has emerged.

On this new map is Pine Point, site of one of the world's largest base metal operations. Mary River, on Baffin Island, is the place name for what is probably the world's biggest deposit of high-grade iron ore. The Mackenzie River Delta and neighboring Arctic Islands are regarded as the likely location of one of the world's largest pools of oil. Historic Coppermine, where the explorer Samuel Hearne looked in vain for the legendary Indian copper mines is now, 300 years later, the centre of one of Canada's biggest claim staking and mine development programs.

The increase in mineral production North of 60 has been dramatic, climbing from $33,897,819 in 1954 to more than $200,000,000 in 1970.

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Yesterday, the extremes, the distances, the climate stood as major obstacles before resource development. Today, with the new technology, new forms of transportation and communication, and a spirit of adventure and challenge among the Canadian people, these obstacles are being rapidly overcome.

Canada North of 60 is a land of discovery for most Canadians. Generations have grown up under the belief that this region was nothing but a worthless land of ice, snow and bitter cold, and inhabited only by the Eskimo and the polar bear. These myths were perpetuated by the first explorers from Europe, who, in their search for the elusive Northwest Passage to the Orient, found themselves stranded on the forlorn shores of Hudson Bay and the islands of the Arctic Archipelago.

Their journeys were not in vain; they found the trading of furs with the indigenous people highly profitable. Over the years they mapped the rivers, the lakes and the coastlines, but beyond the wildlife resource, they never discovered the true potential of northern Canada.

The Canadian north today presents a dramatic picture. The skies are alive with aircraft bearing men and material into the region. Railway steel and highway right-of-way move ever further northward. Whole communities are springing up overnight on the shore of a northern river, or on the rolling tundra, as bulldozer and dynamite uncover new mineral wealth.

Yesterday, it took weeks, and even months, by foot, or canoe, to reach Canada North of 60. Today, it is but a few hours' flying time from the metropolises of North America and Europe. The once crude shelter against the Arctic wind and cold has given way to the modern, comfortable house. The formerly isolated camp is now a warm, fully-equipped settlement, just a twist of a radio dial away from civilization. What used to be a meal of hardtack and tea is now a sizzling steak and fresh salad greens flown in from the south.

The excitement of the Klondike gold rush of the 1890s, which saw many fortunes made – and, many more dreams drowned in the sluice boxes of the Yukon mining camps – has now returned to the Territory. The discovery and development of huge deposits of asbestos, tungsten, silver and base metals have brought new prosperity to this fabled land.

Gold sent the mineral seekers to the Northwest Territories in the 1920s and 1930s, but it is copper, silver, lead and zinc and other valuable metals that are exciting the prospectors and developers. Those in search of oil and gas have moved down the Mackenzie River from their original discovery at Norman Wells to the river delta where what is believed to be one of the world's biggest pools of oil is being outlined.

Modern-day mariners are determined to establish permanently a shipping route through the Northwest Passage to move the riches of the Canadian north to the markets of the world. Ice-smashing tankers and revolutionary new ice-breakers are being assembled to pioneer this venture.

As the custodian of the resources North of 60 the Government of Canada is actively encouraging these developments. It had formulated a series of policies and programs designed to assist the private investor in utilizing his capital and his individual talents in the Territories.

These policies and programs, as they relate to the effective management of oil and gas, mineral, water, forests and land resources, and to the economic development of the Yukon and the

Northwest Territories, are the responsibility of the Northern Economic Development Branch of the Department of Indian Affairs and Northern Development.

In harnessing the natural resources North of 60, the Government of Canada is concerning itself with another resource that is the key to the whole development of the region, that is the 40,000 residents of the two Territories.

For years the indigenous people, representing more than one-half the total population of the region, were neglected by all levels of government. The Indian and Eskimo people have, until recent years, been deprived of opportunity. However, the Federal Government has sought to correct this social problem and has embarked on a number of major programs designed to give the indigenes a place in the economic development of the Territories.

The Government began by providing the Indians and Eskimos with proper shelter, good health care and education. Much has been done, but much more has yet to be accomplished in these fields.

Having provided the indigenes with the opportunities for an education, the Federal Government is now giving top priority to ensure that they can participate in the economic growth of the Territories. Government already is a major employer of indigenes, and has as stated policy the objective of increasing the proportion of its employees which are indigenes as rapidly as possible.

At the same time the Federal Government is seeking to encourage private industry to employ Northern residents, particularly Indian and Eskimo personnel, in not only resource development, but in secondary industries as well, such as tourism and manufacturing.

The Federal Government, realizing the high risks involved in investment North of 60, has a broad program of incentives to assist the private investor, ranging from small business loans to airport and road construction and mineral development.

Programs of direct financial support and indirect capital investment are available for those projects which show the promise of profitable return to both public and private sectors. The Government has already demonstrated a willingness to enter into a partnership with industry in undertaking high-risk exploration programs of a unique nature. Such is its commitment to the development of Canada north of the 60th parallel.

In preparing this Prospectus for the resource and economic development of the Yukon and Northwest Territories, the Northern Economic Development Branch has drawn together the basic information which it considers valuable material of interest to the potential investor.

The Prospectus will be maintained as a current working document by the Branch. The latest information on resource and economic development North of 60 will be forwarded regularly to Prospectus holders.

The Northern Economic Development Branch, in carrying out Government policies and programs, has been given the challenging assignment of bringing the Yukon and Northwest Territories into the economic mainstream of the country. In meeting this assignment it hopes, through this Prospectus, to encourage private investors to participate in this great national venture – and, ultimately, to share in the rewards.

# north of 60

## incentive programs

northern economic
development branch
department of indian affairs
and northern development
government of canada

# INDEX

## INCENTIVE PROGRAMS NORTH OF 60

# INCENTIVE PROGRAMS NORTH OF 60

## 1–1.1 GENERAL

The Federal Government has developed a series of incentive programs designed to aid both companies and individuals in exploration and development activities North of 60. These programs are administered by the Northern Economic Development Branch of the Department of Indian Affairs and Northern Development.

The Branch bas been given the responsibility for the effective management of the oil and gas, mineral, water, forest and land resources, and for the economic development of the Yukon and the Northwest Territories generally.

While development of a general or balanced nature is considered necessary to ensure continued economic growth, the key to any such development lies primarily in the mining and oil and gas sectors. It is the Government's intention, however, to use any success in these areas to create opportunities in other fields such as tourism, fish and game hunting and related industries, through such programs as the new Small Business Loan Funds for the two Territories.

In creating such opportunities, the Federal Government is providing special incentives to the individual resident of the Yukon and the Northwest Territories. Education is playing a most important role in assisting the indigenes of the Territories to participate in the economic development of the two regions. Federally-operated schools and vocational training institutions are teaching new skills and broadening the knowledge of Territorial residents.

Every effort is made by the Federal Government to maintain flexibility in its incentive programs. If no existing program is available to meet a particular situation, assistance may be provided because of the potential merits of the projected development.

For example, to assist in the opening of the Pine Point lead-zinc mines near Great Slave Lake the Federal Government assisted with the construction of a 420-mile railway link, at a cost of $86,000,000. In addition, the Government constructed a 35,000 horsepower hydro-electric plant on the Taltson River, 150 miles from Pine Point, at a cost of approximately $9,000,000.

The Government also constructed an all-weather road from the Mackenzie Highway to Pine Point, and assisted in the establishment of a townsite.

A further example of the Government's flexible approach North of 60 was the formation of Panarctic Oils Limited. The Government joined with a number of private companies as an equity partner to provide more than $9,000,000 for a 45% share in a program of exploration for oil and gas in the Arctic Islands.

## 1–2.1 NORTHERN ROADS NETWORK PROGRAM

The Northern Roads Network Program was approved by the Federal Government in 1965 and provided for an expenditure of $10,000,000 each year for ten years to establish a systematic road network designed for longterm use in the Yukon and the Northwest Territories.

The program involves the development of communication roads to provide a primary road network in the area, and lateral roads which lead from this primary network to areas where resource exploration, development or exploitation are taking place.

For purposes of classification and costing, lateral roads are considered in the following categories:

* Tote Trails
* Initial Access Roads
* Permanent Access Roads
* Resource Development Roads

### 1–2.1.1 Tote Trails

Tote trails are low standard roads designed to provide access to a resource project in the exploration or development stage. Winter roads are included in this category. These trails may be constructed to whatever standard that will provide suitable access to the property. Assistance in the construction of tote trails may be up to 50% of the cost of construction but shall not exceed $20,000.

This program is administered by the Territorial Commissioners for the Yukon and Northwest Territories and they must approve the location of any tote trail before financial assistance can be authorized.

Further information and applications for tote trails are available from the Commissioner of the Northwest Territories or the Commissioner of the Yukon.

### 1–2.1.2 Initial Access Roads

Initial access roads are low standard roads designed to provide access to a resource project which is in the exploration or development stage. This category is intended for cases where, because of length, terrain or difficulty of construction, total cost is such that the $20,000 available under the tote trail category would be insufficient.

Minimum desirable road standards under this category are:

| | |
|---|---|
| Desirable design speed | – 25 mph (not related to minimum standards shown) |
| Width of Right of Way | – 50 feet |
| Width of Travelled Surface | – 12 feet |
| Width of Shoulders | – nil |
| Bridge Design | – H20-S16 |
| Bridge Width and Height | – 12 feet and 12 feet 6 inches |
| Maximum gradient | – 14% |
| Maximum curvature | – 35° |

Particular sections of the road may be built to lesser standards where difficult terrain makes strict adherence to the above standards excessively costly.

The amount of Federal assistance will not exceed 50% of the actual road cost, or 5% of the company's expenditure on exploration or development of the project whichever is the lesser. The maximum yearly contribution is limited to $100,000 if the project is exploratory in nature and $500,000 if the project is primarily development. The location of the initial access road must be approved by the Minister of Indian Affairs and Northern Development.

Further information and applications for financial assistance are available from the Northern Economic Development Branch, Department of Indian Affairs and Northern Development, Ottawa.

**1–2.1.3 Permanent Access Roads**

Permanent access roads are higher standard roads designed to provide permanent access from an existing permanent road to a resource project which has been brought to the pre-production or production stage. The minimum desirable road standards are:

| | |
|---|---|
| Desirable design speed | – 50 mph (not related to minimum standards) |
| Width of right of way | – 100 feet |
| Travelled surface | – 18 feet |
| Width of shoulders (each) | – 3 feet |
| Bridge design | – H20-S16 |
| Bridge width and height | – 24 feet and 14 feet 6 inches |
| Maximum gradient | – 10% |
| Maximum curvature | – 20° |

Particular sections of the road may be built to lesser standards where difficult terrain makes strict adherence to these standards excessively costly.

The Department of Indian Affairs and Northern Development may authorize a contribution of up to 2/3 of the cost of construction but not exceeding 15% of the actual capital invested by the company prior to the start of commercial production or exploitation, or $40,000 per mile, whichever is lesser.

The location of the road must be approved by the Minister of Indian Affairs and Northern Development.

Further information and applications for financial assistance are available from the Northern Economic Development Branch, Department of Indian Affairs and Northern Development, Ottawa.

**1–2.1.4 – Resource Development Roads**

Resource development roads are financed completely by the Federal Government and are designed to provide permanent access to two or more particular resource development centres. For example, when two or more mines have reached the production stage or are committed to do so, the Federal Government may build a resource development road from the nearest permanent road to the area where the mining is taking place.

The minimum desirable road standards are:

| | |
|---|---|
| Desirable design speed | – 50 mph (not related to minimum standards) |
| Width of right of way | – 100 feet |
| Travelled surface | – 18 feet |

| | |
|---|---|
| Width of shoulders (each) | – 3 feet |
| Bridge design | – H20-S16 |
| Bridge width and height | – 24 feet and 14 feet 6 inches |
| Maximum grade | – 10% |
| Maximum curvature | – 20° |

**1–2.1.5 Area Development Roads**

Area development roads are roads of relatively low construction standard into or through an undeveloped region of favourable natural resource potential for the purpose of fostering new growth in the economic activities of the territory.

The Minister of Indian Affairs and Northern Development may approve construction of an area development road on recommendation from the Interdepartmental Roads Appraisal Committee and if he is satisfied that the road will provide access to an area having a favourable natural resources potential.

Construction of an area development road is the responsibility of the Federal Government. Maintenance costs are shared 85% by the Federal Government, and 15% by the Territorial Government.

The minimum desirable road standards are:

| | |
|---|---|
| Desirable design speed | – 50 mph (not related to minimum standards) |
| Width of right of way | – 100 feet |
| Travelled surface | – 18 feet |
| Width of shoulders (each) | – 3 feet |
| Bridge design | – H20-S16 |
| Bridge width and height | – 24 feet and 14 feet 6 inches |
| Maximum grade | – 10% |
| Maximum curvature | – 20° |

## 1–3.1 – NORTHERN MINERAL EXPLORATION ASSISTANCE PROGRAM

The Northern Mineral Exploration Assistance Program is designed to encourage the investment of domestic risk capital in both mineral and oil and gas exploration North of 60.

At the same time it seeks to reach those source of capital which up to now have been unable to take advantage of the write-offs allowed under the Income Tax Act to those engaged in the exploration and development of minerals and petroleum.

In effect, recipients of the assistance grant may receive comparable benefits to those obtainable by companies which can now do so under paragraphs (a) and (b) of subsection (3b) of Section 83A of that Act.

Subsection (3b) of Section 83A of the Income Tax reads, "A corporation whose principal business is

(a) production, refining or marketing of petroleum, petroleum products or natural gas, or exploring or drilling for petroleum or natural gas;

(b) mining or exploring for minerals;

may deduct in computing its income under this Part for a taxation year, the lesser of

(f) the aggregate of such of

(i) the drilling and exploration expenses, including all general geological and geophysical expenses, incurred by it on or in respect of exploring for drilling for petroleum or natural gas in Canada, and

(ii) the prospecting, exploration and development expenses incurred by it in searching for minerals in Canada

as were incurred after April 10, 1962, and before the end of the taxation year, to the extent that they were not deductible in computing income for a previous taxation year, or

(g) of that aggregate, an amount equal to its income for the taxation year."

if deductions had not been allowed under other sections of the Act."

### Applications

Applications for Northern Mineral Exploration Assistance Grants, when completed to the satisfaction of the Minister, are dealt with in the order in which they are received whether or not the grant, if approved, is made in the same fiscal year as the application. A grant may not exceed 40% of the cost of an approved exploration program. Provision has been made for the Department to make payments, over an unspecified number of years, up to an aggregate ceiling of $9,000,000.00.

Applicants for grants must, if individuals, be over 21 years of age, Canadian citizens and own beneficially the holdings upon which it is proposed to carry out an exploration program or otherwise be entitled to do exploration work on these holdings by virtue

of a lease or option agreement. The term holding is used for convenience as it can encompass a mineral claim, a lease, or permit to explore. Private companies applying for a grant must be at least 50% beneficially owned by Canadian citizens and incorporated in Canada, or in a Province of Canada. Public companies must be incorporated in Canada, or in a Province of Canada. They must also have their common shares listed on a Canadian stock exchange or have them offered for sale to the public in Canada through a registered secutities dealer.

Provision is also made in the Regulations for the making of grants to companies incorporated in Canada, or in a Province of Canada, formed for the purpose of and engaged in exploring for minerals in Northern Canada where the company is the beneficial owner of the holdings over which the exploratory program is to be carried out, or it has a lease or option agreement to work on these holdings, and not more than 15% of its issued common shares are beneficially owned in the aggregate by one or more companies of the type described in paragraph (a) or (b) of subsection (3b) of section 83A of the Income Tax Act.

**Assessment**

An applicant for a grant must submit all the information required to assess his eligibility for assistance, and must, in the event that an exploratory program which will not be completed in the same fiscal year, break down his program into stages with estimates of costs to be incurred during each stage. This will facilitate the estimating of the amount of funds required in future years.

**Assisgnment**

No assignment or transfer of holdings or of an interest in them may be made without Ministerial approval once an exploratory program has been approved for a grant.

**Payment**

After a grant has been approved, no payment or part payment of the grant will be made until the completion of the entire exploration program or a pre-approved stage thereof. There is, however, a provision that where it has become evident, as a result of preliminary exploration that further work would result in dissipation of funds, a proportional payment may be made based on the expenditures incurred up to the time of cessation of the program.

**Statements**

Recipients of grants are required to submit a statement of their program expenditures within ninety days of the completion of an exploratory program or of a pre-approve stage thereof. All statements of expenditure must be verified by statutory declaration and be accompanied by a full report containing details of all information gained as a result of the expenditures made.

**Public Information**

As public funds are involved, provision is made for information obtained on holdings as a result of an exploration program to be made public two years after the completion of the program.

**Repayments**

A grant is not subject to repayment if the recipient is notified by the Minister that, in his opinion, no indication has been found of the presence of oil, gas, or other minerals in quantities likely in the future to permit production for gain as a result of the exploratory program.

Grants become repayable on the first anniversary of the date on which production for gain begins, the date of which is normally established as being three calendar months following the official date of the mine opening announced by the recipient. The rate of annual repayment will not be less than 10% of the outstanding grant, together with interest. The rate of interest as a percentage rate will be equal to 2 plus the average of the interest rates stated on the face of long term Government of Canada Bonds outstanding during the calendar year preceding the year in which the payment is due. In the case of a recipient being a public company whose common shares are quoted on a Canadian stock exchange, if the Minister and the recipient of the grant agree, the issue to Her Majesty in right of Canada of common shares having an aggregate market value equal to the amount owing on the date of the agreement will be accepted. A repayment may also be made partly in cash and, by agreement, partly by issuing common shares. In the event that full repayment in part common shares and part cash is not made in one transaction not less than 10% may be paid as a first instalment of the outstanding part of the grant with a similar amount and interest on each subsequent instalment. A recipient may repay a grant in full at any time without notice or bonus.

Provision is made, where in the opinion of the Minister, economic circumstances justify a change in the rate of repayment of a grant, to increase the amount of the instalments to the paid and power is also given to decrease the amount of the instalments and reduce the rate of interest payable. The former would likely occur where the mine operated at a considerably higher profit level than initially anticipated while the latter would apply in the converse situation. Further, because of new discoveries richer, and nearer centres of consumption, an operation might cease to be profitable in which event the Minister may forgive the unpaid balance of the grant in whole or in part together with interest thereon.

**Representation**

No person may represent that the approval of or making of a grant connotes Government sponsorship of his company. This provision is to avoid unintentionally misleading the public or company subscribers into believing that Government assistance presupposes the presence of economic mineral depositation on any of the holdings described in the applicant's application.

**Breaches**

Should a recipient be in breach of the regulations, he will be required to repay the amount of grant paid to him in full with interest at a rate of 10% per annum from the date or dates of the advance of the money. Further, he will be prohibited from obtaining a grant in the future.

**General**

Applicants are considered on a first-come basis. Copies of the Northern Mineral Exploration Assistance Regulations and application forms are available from the Northern Economic Development Branch, Department of Indian Affairs and Northern Development.

## 1–4.1 PROSPECTOR'S ASSISTANCE PROGRAM

Prospectors may be provided with grants of up to $900 per year under this program to assist in outfitting and transportation costs to their area of activity. A total of $60,000 is available annually for both Territories. Two thirds of the grant to each prospector may be provided in advance. The program is designed to assist individual prospecting activities but two or more prospectors may pool their resources to reduce charter flying costs and similar common expenses. In this case however each prospector is eligible for the maximum grant.

The program is administered by a screening board and every application must be approved by this board. Applications are considered on a first-come basis. A prospector must spend a minimum of 60 days in the field and is required to submit a diary and report to recieve fianal payment.

Applications for assistance may be obtained form any Mining Recorder's office in the Territories or from the Northern Economic Development Branch, Department of Indian Affairs and Northern Development, Ottawa.

## 1–5.1 NORTHERN RESOURCE AIRPORTS PROGRAM

Resource airports are divided into two categories:

(a) Exploratory airports – built to assist initial exploratory work or to assist in locating mineral or other natural resources.

(b) Pre-production airports – built to assist in the pre-production or early production phases of resource exploitation. These are constructed to a higher standard than exploratory airports.

Cost sharing agreements for the establishment of the above types of airport may be made between the Federal Government and a natural resource development company, a private tourist or recreational enterprise or an established air carrier.

Both categories of airport are to be built to the standards considered adequate by the Federal Government's Department of Transport. The private company has the responsibility for construction, maintenance and operation of all airports constructed under this program. Such airports are to be available for public use at all reasonable times and are held by or are arranged to be transferred to the Federal Government. In certain cases landing fees may be charged by the company operating the airport to help defray airport maintenance. Approval for charging such fees must first be obtained by the company from the Department of Indian Affairs and Northern Development.

It is the policy of the Department to negotiate only with a single company or agency for the construction of a resource airport. If more than once company or agency is involved, it is suggested they form a single agency or syndicate to negotiate with the Government.

### 1–5.1.1 – Exploratory Airports

Exploratory airports are airstrips of minimum dimensions which serve specific resource sites at which one or more private companies are active. Such airstrips are constructed at the exploration phase of resource exploitation for the purpose of bringing in personnel, supplies and equipment. In other cases, their primary usage may be to provide access to a locality on behalf of one or more tourists entrepreneurs initiating recreational developments. Departmental participation in the construction of airstrips of this type is to be contingent upon the receipt of reasonable evidence that the area in question has a resource potential, and that the project itself is worthy of public assistance.

Such airstrips are built to the minimum standards considered adequate by the Department of Transport for their intended use.

The Department of Indian Affairs and Northern Development will pay fifty per cent of the cost of an individual exploratory airport up to a maximum Federal expenditure of $20,000. Where the full cost of any such airstrip exceeds $40,000, the private cost sharing interest will bear the full cost in excess of this amount. The annual Federal expenditure for airstrip construction assistance in the NWT and YT is expected to average out to $160,000, depending on the pace of northern exploratory activity. It is the intention to spend roughly half of the total Federal amount in each of the Yukon and Northwest Territories during any single year.

Federal cost sharing may take place with a natural resource development company, a private tourist or recreational enterprise, or any established air carrier. The company concerned must be able to provide demonstrable evidence of its financial and general reliability and the Federal cost sharing must in all instances be directly connected with some form of natural resource development. The cost-sharing company – for the duration of its operational interest in the completed facility – shall make its exploratory aerodrome available for public use at all reasonable times.

Operation and maintenance will be the responsibility of the private interests concerned.

**1–5.1.2 – Pre-production/Production Airports**

These airports provide access to specific resources sites at which one or more companies are active at the pre-production or early production phase of resource exploitation (or at its equivalent for example in terms of development of tourist facilities). As such airports are being constructed primarily for the benefit of the companies concerned, Department of Indian Affairs and Northern Development participation in their construction will be contingent upon its receipt of good evidence from the company or companies involved that the operation in question is expected to be of reasonably long duration and public advantage.

An economic evaluation of the company's operations and of the general circumstances must be prepared in connection with the proposed airport prior to seeking Treasury Board's approval for the release of public funds for its construction. The project would be deemed undeserving of public financial assistance if the economic evaluation is unable to substantiate that the project itself will be significantly beneficial for the territory concerned.

While pre-production or early production phase airports do not have an important general aviation role, they nevertheless will have some role in this respect. In some cases, they may be required to serve multi-engine aircraft with a degree of regularity once the resources in their vicinity are being actively utilized. Because of this, provision should be made at the outset for the possibility that these airports, at their ultimate development, may become mainline airports. Thus, one runway should be located and designed so as to have an extendable length capable of accommodating larger aircraft and the Department of Transport is to be consulted on their design and construction.

The Federal Government may pay fifty per cent of the cost of a pre-production or early production phase airport up to a maximum Federal expenditure of $100,000 per airport. The interested private company (or companies) will contribute the balance and will bear fully any airport construction costs exceeding $200,000. The necessary funds will be sought by means of the inclusion of a specific item in the appropriate vote of the Department's estimates following receipt of a request for assistance.

Operation and maintenance of pre-production or early production phase airports will be the responsibility of the private interests concerned. These airports must be available for public use at all times. If it is decided subsequently that an airport of this category should be reclassified, the new responsibility for operation and maintenance will be determined by the terms of the new classification.

**1–5.1.3 – Application of Policy**

The following is a guide to eligible items for development which will be considered in each new airport or airport improvement which is approved.

Land Acquisition

– Resource airports in the Northwest Territories and Yukon Territory will always be built in areas where the surface rights to the land are held by or can be arranged to be transferred to the Federal Government. The Federal Government retains ownership of airports built under the provision of this policy. When a resource airport is reclassified, and operation and maintenance is taken over by a government agency, the company will have no claim to compensation for funds expended on construction operation or maintenance prior to its takeover.

Preparation of Site

– Eligibility of grading, drainage, and associated items of site preparation will be limited to the overall site preparation required for development in accordance with the approved plan. Grading in approach areas is eligible only to remove terrain which constitutes an obstruction.

– Eligible drainage work off the airport site includes drainage outfalls, drainage disposal, interception ditches, etc.

Runways

– Runways may be developed initially of turf, graded, gravelled or paved surfaces in accordance with approved specifications and current Department of Transport standards, depending upon the operational requirement in each case and subject to site consideration.

– Types of work eligible include reconstruction and resurfacing where such resurfacing is to increase the load bearing capacity of the runway or to provide a levelling course to correct major irregularities in the surface.

Taxiways

– Taxiways may be developed initially of turf, graded gravelled or paved surfaces in accordance with approved specifications and current Department of Transport standards depending upon the operational requirement in each case.

Aprons

– The construction of aprons will be eligible.

Roads and Sidewalks

– The construction of airport roads which are wholly within the airport boundaries will be eligible if justified on the basis of actual need for operating and maintaining the airport.

Fencing

– Boundary or perimeter fences for security purposes will be eligible.

Miscellaneous

– In addition to avove items, such other items that may be specicifically approved by the Department are eligible.

Eligibility or Repair Work vs. Maintenance Work

– Unlike repair work, maintenance work is not airport development and, therefore, is ineligible for inclusion in the Department's assistance program. Consequently, it will be necessary in many cases that a determination be made whether the work proposed is maintenance or repair.

– As a guide in making a judgment by the applicant in such matters, "maintenance" should be regarded as including any regular or recurring work necessary to preserve an existing facility in good condition, any work involved in the care or cleaning and incidental or minor repair work on existing airport facilities. On the other hand, repair work or reconstruction should be regarded as including any major work necessary to restore or preserve the facilities.

General

– After receipt and approval of a request for assistance, funds will usually be provided in the Departmental estimates for the year following but in some cases where there is a need for speedy action, the funds may be provided during the current fiscal year.

Project Requests

– A formal request in writing for assistance is necessary before any proposed project will be considered. The purpose of the request is to provide funds made available by Parliament. The request will be considered only as a preliminary notice of the applicants interest without obligating it or the Department to perform any work or expend any funds. Acknowledgement of the request does not imply that the proposed project will be approved or included in the program for any particular year.

Project Evaluation

– Each proposed airport project will be assessed to determine the amount of departmental funds that would be involved. The relative importance of any request for assistance is dependent upon the degree to which it can be shown that:

(i) a given area has resource potential but assistance is necessary to encourage further exploration.

(ii) the development of proven potential is economically feasible, but encouragement and assistance are necessary to bring about the actual exploitation of the resource.

Application

– Requests for assistance will be submitted to the Director, Northern Economic Development Branch, Department of Indian Affairs and Northern Development, 400 Laurier Avenue West, Ottawa 4.

– The filing of a request is the first step and indicates the interest and ability of the applicant to undertake the development if departmental funds are made available and outlines the work proposed by the applicant. It also provides information on which the department can base its evaluation of the project.

– Items of development proposed for inclusion in a request for assistance will be considered in the light of Department of Transport standards existing at the time. Each item or project for which assistance is sought will be justified on its own merit and must contribute towards the usefulness of the airport and safety of operations.

Advance Planning

– In cases where an eligible project cannot be completed in one fiscal year, allocations may be made for more than one fiscal year provided, however that any such future allocations cannot be accepted as a departmental commitment until Parliament has approved the necessary funds.

## 1–6.1 OTHER PROGRAMS AND INCENTIVES

The Federal Government will in some instances finance economic feasibility studies of proposed northern primary production operations. The Government also provides assistance and services such as financial support for Chambers of Mines, subsidized assay services, strategically located mining recorder's offices and the planning and development of certain townsites.

Federal Government departments and agencies work together in providing material assistance to various resource development operations. The Departments of Transport and Public Works may provide or assist in developing physical facilities necessary for the movement of materials in pre-production operations and the subsequent shipment of material in production operations. The Northern Canada Power Commission, a Crown agency may be involved in the provision of hydro-electric or thermally generated electric power to production operations, such as at Pine Point and Yellowknife.

These forms of financial aid and general assistance are over and above the various tax concessions, benefits and write-offs available to companies under the Income Tax Act.

The form and amount of assistance depends on the actual operation envisaged – in particular, its potential contribution to the objectives of northern development.

Inquiries for additional information on incentive programs may be obtained from the Northern Economic Development Branch, Department of Indian Affairs and Northern Development, Ottawa.

## 1–7.1 – SMALL BUSINESS LOAN FUNDS

In a move to meet the special requirements of small business enterprises North of 60 the Federal Government has established Small Business Loan Funds, amounting to $5,000,000 each for the Yukon and the Northwest Territories. Loans will be made available as soon as the administrative machinery is established. They will be administered by local credit committees in Whitehorse, YT, and Yellowknife, NWT.

Under the plan, up to $300,000 will be lent annually in each Territory from the funds to businesses already operating or to entrepreneurs starting a new business.

The Government established the program because small business men North of 60 generally lacked access to sufficient capital or credit to finance the higher-than-average investments required for northern operations. Existing credit sources in the Territories, such as chartered banks, have been unable to meet the special needs of small businesses in the regions.

Such businesses as hotels, laundries and restaurants, municipal services and small manufacturing plants will be able to take advantage of the funds. The interest rate will be such that the scheme is self-sustaining except for administrative costs connected with the provision of management advice, which will be absorbed by the Federal Government.

Only residents of the two Territories are eligible for loans.

Further information may be obtained by writing:

Director,
Territorial Relations Branch,
Department of Indian Affairs and Northern Development,
400 Laurier Avenue W.,
Ottawa 4, Ontario.

# north of 60

## oil and gas

northern economic
development branch
department of indian affairs
and northern development
government of canada

# INDEX

## OIL AND GAS NORTH OF 60



**Maps**

**Figures**



**Tables**

# OIL AND GAS NORTH OF 60

## 2–1.1. GENERAL

The world's oil and gas seekers today are converging on Canada North of 60 looking for what most experts now feel will be one of the biggest oil pools ever discovered. Encouraged by favorable geological conditions and by discoveries in neighboring areas of Alberta, British Columbia and the Prudhoe Bay region of the north Alaskan coast, the explorers are moving men and material into the western Arctic for the hunt.

How much oil and gas will be found is, of course, unknown. However, by comparing the estimated volume of sediments with those in other areas of more advanced stages of development some reasonable calculations can be made.

North of 60 about 450,000 square miles are underlain by sedimentary rocks, ranging in age from Cambrian to Tertiary that may be considered to be potentially productive of oil and gas. Excluding all sediments in areas where the total section is less than 1,000 feet thick, as well as those at depths exceeding 16,000 feet, – at present believed to be only marginally attractive – there are nearly 100,000 cubic miles of sedimentary rocks.

Applying a factor of 50,000 barrels of oil and 300,000,000 cubic feet of gas per cubic mile of sediment – the average established in the United States where many basins have been subject to rather complete exploration – possible reserves North of 60 may be 50 billion barrels of oil and 300 trillion cubic feet of gas.

A comparison of the sedimentary areas, volumes and proven oil and gas reserves in the Western Provinces, the Yukon, Northwest Territories and Arctic Islands indicates that from the standpoint of oil and gas, Canada North of 60 is virtually unexplored. Since 1947 – generally considered to be the beginning of the modern era for oil and gas exploration in Canada – there has been one exploratory well drilled on the mainland North of 60 for each 1,800 square miles of sedimentary area. In the Arctic Islands, the exploratory drilling density is one well for every 100,000 square miles. This contrasts with the Western Provinces where the density of exploratory drilling is one well for every 40 square miles. (See MAPS 2-1 and 2-2, Table 2-1.)

### 2–1.1.1 – Norman Wells

The existence of oil North of 60 has been known since 1789 when Alexander Mackenzie recorded the presence of oil seeps along the banks of the river that bears his name, near Norman Wells.

In 1890 other explorers recorded the discovery of oil seepages along the north shore of Great Slave Lake, and near Fort Good Hope, down-river from Fort Norman.

Encouraged by the results of a detailed study of the area, the Northwest Company, a subsidiary of Imperial Oil Limited, began drilling Discovery No. 1 in 1920. Oil was found in fractured shales at a depth of 783 feet and development drilling led to the discovery of oil in the underlying Kee Scarp reef, now the producing horizon at Norman Wells.

The field developed slowly until World War II created a great demand for petroleum products in northern Canada and Alaska. Many development wells were drilled in the early 1940's and the Canol crude oil pipeline, completed in 1944, linked the field to a refinery at Whitehorse. Gross production rose from 267,000 barrels in 1943 to 1,220,000 barrels in 1944. The pipeline operation was terminated the following year and since 1945, production has varied

from 1,500 to 2,000 barrels a day with 1968 production being at a daily rate of 1,874 barrels.

Norman Wells oils reservoir is a coralline limestone reef located between an upper and lower shale series of Devonian age. The porous portion of the reef rests on a basal reef limestone about 100 feet thick, which extends over a wide area beyond the productive limits of the pool. The structure is monoclinical and dips in a southwesterly direction at an angle of approximately four degrees. Closure of the oil saturated section is formed by a pinching out of the reef on the updip side. On the downdip side edgewater limits the productive outline.

The average gross thickness of the oil saturated reef is 244 feet with the thickest section encountered being 388 feet. The effective productive outline of the Norman Wells pool is 3,800 acres.

Information regarding porosity and permeability is limited. Cores were taken in several wells, but the entire section was cored and analysed from only one well (Mainland 37X). The weighted average porosity of the effective section in well 37X is 13.3 per cent and the average permeability to air is 10.5 millidarcys. The connate water saturation of the reservoir has not been determined but 25 per cent has been assigned for reserve estimates. The shrinkage 0.813. On the basis of this data the Norman Wells field is estimated to contain 419 million barrels of oil-in-place. The field has produced about 12 million barrels, and the Canadian Petroleum Association estimates 48 million barrels of additional recoverable oil.

Of the Norman Wells refinery products, middle distillates are in largest demand. This leaves a surplus in lighter and heavier distillates. The lighter products are re-injected, while the heavier residual is burned. Additives and alkylates for blending are brought to the local refinery from Edmonton, Alberta, to provide premium motor and aviation gasoline for markets along the Mackenzie River and Arctic Coast.

Forecasts made by Imperial Oil Limited indicate that demands for petroleum products from the Norman Wells refinery will increase. Their studies also show that the supply of crude from the field will begin to decrease under natural depletion in the near future. To sustain productivity and meet forecast requirements a downdip water injection scheme is being implemented and two additional producers were drilled in the summer of 1968. (See TABLES 2-2 to 2-4.)

**2–1.1.2 – Panarctic Oils Ltd.**

The great land masses of Canada's Arctic Islands have long been regarded as a potential "treasure house" of metallic, hydrocarbon and other minerals. A few years ago, the Canadian Government set up mineral rights exploration policies to encourage Arctic development. A host of companies took up oil and gas permits on some 65,000,000 acres and several million dollars were spent on surveys, and on the drilling of three costly exploratory wells.

Interest in the Arctic waned during the 1964-1967 period because of high costs and high risk factors, and because of attraction or risk capital to such areas as the North Sea oil and gas play, and the Western Canadian provinces. However, in October, 1967, several of Canada's leading oil and mining firms agreed to carry out a joint exploration program in the Arctic Islands and in December, 1967 the Canadian Government agreed to provide additional funds under its Northern Mineral Exploration Assistance Program. Panarctic Oils Ltd. was on its way and the long-discussed hunt for oil and minerals in the Arctic Islands reached a new stage.

Panarctic's initial financing involves $20,050,000 of which Canada's Government will provide $9,022,500 for a 45 per cent equity, and private capital will contribute


OIL & GAS DISCOVERIES
SCALE OF MILES
100 0 100 200 300
LEGEND
GAS WELL
OIL WELL
OIL FIELD
Yukon Territory
NORTHWEST TERRITORIES
Norman Wells
Arctic Circle

MAP NO. 2–1

MAP NO. 2–2


WELLS DRILLED 1968
SCALE OF MILES
100 0 100 200 300
LEGEND
OIL WELL
DRY AND ABANDONED
GAS WELL
NORTHWEST TERRITORIES
Yukon Territory

## TABLE 2-1

### Sedimentary areas, volumes and proven oil and gas reserves

| | Sedimentary Area (sq. miles) | Sedimentary Volume (cu. miles) | Exploratory wells | Crude Oily (thousands of barrels) Produced | Remaining Proven | Total | Natural Gas. * (millions of cu. feet) Produced | Remaining Proven | Total |
|---|---|---|---|---|---|---|---|---|---|
| Manitoba and Saskatchewan | 176,623 | 168,072 | 4,457 | 841,200 | 791,619 | 1,632,819 | 654,105 | 728,967 | 1,383,072 |
| Alberta | 236,893 | 341,715 | 6,812 | 2,456,681 | 7,030,049 | 9,486,730 | 10,544,054 | 36,890,431 | 47,434,484 |
| British Columbia | 50,688 | 115,318 | 600 | 86,468 | 294,246 | 381,714 | 1,384,231 | 7,752,745 | 9,100,076 |
| Yukon | 43,000 | 64,500 | 26 | – | – | – | – | – | – |
| Northwest Territories (Mainland) | 204,794 | 267,133 | 113 | 11,389 | 47,848 | 50,237 | 8,584 | 107,698 | 116,282 |
| Arctic Islands | 350,000 | 663,500 | 3 | – | – | – | – | – | – |

* Source: Canadian Petroleum Association

## TABLE 2-2

## OIL AND GAS REVENUES NORTH OF 60

| Year | Yukon | Northwest Territories | Total |
|---|---|---|---|
| 1958 – 59 | $1,548,315.14 | $6,634,330.75 | $8,182,645.89 |
| 1959 – 60 | 39,878.18 | 2,986,104.62 | 3,025,982.80 |
| 1960 – 61 | 5,915.91 | 1,836,797.29 | 1,842,713.20 |
| 1961 – 62 | 176,214.56 | 1,106,910.42 | 1,283,124.98 |
| 1962 – 63 | 27,014.80 | 849,958.88 | 876,973.68 |
| 1963 – 64 | 413,601.21 | 774,477.75 | 1,188,078.96 |
| 1964 – 65 | 25,495.00 | 852,773.07 | 878,268.07 |
| 1965 – 66 | 19,749.89 | 6,252,548.55 | 6,272,298.44 |
| 1966 – 67 | 92,098.05 | 1,680,277.49 | 1,772,375.54 |
| 1967 – 68 | 185,069.82 | 1,902,349.70 | 2,087,419.52 |

## TABLE 2-3

## NORMAN WELLS PRODUCTION AND ROYALTIES

| Year | Production | Value of Crude to Refinery | Average Well Head Price/Barrel | Crown Revenues |
|---|---|---|---|---|
| 1958 | 457,086 | 856,449.51 | 1.83 | 234,001.65 |
| 1959 | 430,319 | 749,073.00 | 1.77 | 234,315.00 |
| 1960 | 468,545 | 619,257.00 | 1.37 | 175,981.00 |
| 1961 | 516,979 | 652,368.00 | 1.24 | 92,768.00 |
| 1962 | 566,168 | 642,095.00 | 1.10 | 133,329.00 |
| 1963 | 630,465 | 600,901.00 | .72 | 69,882.00 |
| 1964 | 574,125 | 585,139.00 | .98 | 51,258.00 |
| 1965 | 660,770 | 665,556.00 | 1.12 | 178,878.00 |
| 1966 | 741,476 | 852,549.00 | 1.15 | 213,571.00 |
| 1967 | 684,179 | 532,633.00 | .82 | 106,229.00 |

## TABLE 2-4

## NET CASH EXPENDITURES OF THE OIL INDUSTRY NORTH OF 60

(in thousands of dollars)

| | CALENDAR YEAR | | |
|---|---|---|---|
| | 1965 | 1966 | 1967 |
| 1. EXPLORATION – | | | |
| (a) Geological & Geophysical Expenditures | 8,100 | 9,000 | 11,288 |
| (b) Exploratory Drilling – | | | |
| Dry | 11,000 | 6,500 | 6,097 |
| Productive – Oil | 2,000 | – | – |
| – Gas/Condensate | 100 | 3,700 | 4,206 |
| (c) Land Acquisitions and Rentals | 1,500 | 7,800 | 4,567 |
| (d) Overhead (not included above) | – | – | – |
| | 22,700 | 27,000 | 26,158 |
| 2. DEVELOPMENT DRILLING – | | | |
| (a) Dry | – | – | – |
| (b) Productive – Oil | – | – | – |
| – Gas/Condensate | – | – | – |
| (c) Overhead (Not included above) | – | – | – |
| 3. CAPITAL EXPENDITURES | | | |
| (a) Field Equipment – Oil | – | 300 | 100 |
| – Gas/Condensate | – | – | – |
| (b) Secondary Recovery and Pressure Maintenance Project | 200 | – | – |
| (c) Other | 200 | 300 | 188 |
| 4. OPERATION OF WELLS – Including Flow lines and Related Facilities | 200 | 300 | 376 |
| 5. NATURAL GAS PLANTS – | | | |
| (a) Capital Expenditures | – | – | – |
| (b) Operating Expenditures | – | – | – |
| 6. GENERAL – | | | |
| (a) Taxes (including income tax) | – | – | – |
| (b) Royalties | 200 | 200 | 198 |
| (c) All Other Expenses (not allocated in 1-5) | – | 250 | 622 |
| TOTAL EXPENDITURES | 23,300 | 28,050 | 27,643 |

$11,027,500 for a 55 per cent total equity. Involved are 2,000,000 Preferred Shares of $10 par, being purchased for $20,000,000 and 500,000 Common Shares issued at ten cents each. (See Table 2-5)

Government and corporations are participating in equity on the same terms. All original shareholders have comparable priority in providing additional capital, when and if required.

The Government, in addition, is owner of the mineral rights in the Arctic Islands, and will receive its normal fees and rentals on exploration rights, and royalties on production.

Panarctic has acquired over 44 million acres of oil and gas permits in the Arctic Islands and the initial $20,000,000 will go into exploration over a three-year period. In addition to the extensive geological and geophysical surveys, the program involves some 17 wells, including nine deep tests, six wildcats of medium depth, and two shallow tests.

Panarctic's field exploration program commenced in 1968 when seismic and gravity surveys, as well as geological studies, were carried out in the Arctic Islands. Initial drilling began in the 1969 spring season on Melville Island.

The Arctic permits cover petroleum and natural gas rights only. However, exploration will be directed towards not only these hydrocarbon resources, but also sulphur, metallic minerals and other natural resources. Under the agreements, Panarctic management has 15 days' priority to stake claims on any mineral deposits located as a result of the Company's work. Only in the event of Panarctic deciding against staking of claims within that time limit, would individual shareholders of that company on their own behalf have the right to stake claims.

**2–1.1.3 Beaver River – Pointed Mountain**

The tri-corner area of the Yukon, Northwest Territories and British Columbia is an area of intense drilling activity and a high level of interest. This great interest has been generated by the discovery of two large gas fields and a proposed gas transmission line into the area.

Geologically, this area, known as the Liard Plateau, comprises numerous tight anticlinical structures bounded by broad synclines. The anticlines are complex and sinuous with steep east and west dipping faults on the flanks. The rocks represented are Cretaceous sands and shales underlain by Carboniferous sands which are underlain by Mississippian and Upper Devonian shales. Carbonates ranging in age from Middle Devonian to Ordovician form the main reservoir beds with the Carboniferous sands forming secondary objectives. Six wildcat wells have been drilled and gaseous hydrocarbons have been found in Middle Devonian Carbonates where they occur deeply buried in the core of these anticlines.

The Beaver River gas pool, on the Yukon, – British Columbia border and the Pointed Mountain gas pool in the adjacent part of the Northwest Territories were discovered in 1958 and 1966 respectively by Pan American Petroleum Corporation and in January, 1967, Pan American entered into a Gas Development Contract with Westcoast Transmission Company. The contract contains an agreement in respect to construction of a $15 million, 20 inch pipeline from Westcoast's present terminus at Fort Nelson, B.C., to a point at the Beaver River gas pool in British Columbia one mile south of the Yukon border if sufficient gas reserves were proved up and if permission could be obtained to export the gas to the United States. The contract also

contains a gas purchase agreement to the effect that deliveries of gas from Pan American's reserves in the Beaver River – Pointed Mountain area will be made to the pipeline at a daily rate of 100 MMcf commencing November 1, 1969, and increasing to 205 MMcf/d commencing November 1, 1970. There is an option to purchase a further 200 MMcf/d by increments after 1970.

Westcoast has obtained the necessary export-import licences, and, in order to establish reserves, Pan American has started an active development drilling program in the Liard Plateau. The company has drilled three wells on the Beaver River gas pool in British Columbia and a fourth development well is now being drilled on the same structure in the Yukon. In addition two development wells were drilled at Pointed Montain in the Northwest Territories.

The Beaver River and Pointed Mountain discoveries, along with a proposed pipeline into the area, have also triggered a new exploratory cycle. Pan American are now drilling a wildcat well 12 miles west of Pointed Mountain on what appears to be the north end of the complex structure which contains the Beaver River pool and a second wildcat is being drilled jointly by Pan American and shell 20 miles Northwest of the Beaver River pool.

## TABLE 2-5

### PARTICIPANTS IN PANARCTIC OILS LIMITED

| PARTICIPANTS: | PANARCTIC OILS LIMITED PRESENT COMMITMENTS: | | | |
|---|---|---|---|---|
| *Item:* | *PERCENT:* | *Preferred Shares:* | *Common Shares:* | *Amount committed, Explor'n:* |
| GOVERNMENT OF CANADA | 45.0000 | 900,000 | 225,000 | $ 9,022,500.00 |
| CANADIAN PACIFIC OIL & GAS LIMITED Calgary, Alberta | 9.0349 | 180,698 | 45,174 | $ 1,811,497.40 |
| COMINCO LTD. (C.P.I. Group) Montreal, P.Q. | 9.0349 | 180,698 | 45,174 | $ 1,811,497.40 |
| DOME PETROLEUM LIMITED (Dome Group) Calgary Alberta | 4.0657 | 81,314 | 20,329 | $ 815,172.90 |
| DOME MINES LIMITED (Dome Group) Toronto, Ontario | .8131 | 16,263 | 4,066 | $ 163,036.60 |
| CAMPBELL RED LAKE MINES LTD. (Dome Toronto, Ontario | .4066 | 8,131 | 2,033 | $ 81,513.30 |
| SIGMA MINES (QUEBEC) LIMITED (Dome) Toronto, Ontario | .1355 | 2,711 | 678 | $ 27,177.80 |
| EAGLE RIDGE PETROLEUM LTD. (Cemp. Inv.) Montreal, P.Q. | 4.5175 | 90,349 | 22,587 | $ 905,748.70 |
| CANADIAN NICKEL CO. LTD. (Inco Group) Toronto, Ontario | 4.5175 | 90,349 | 22,587 | $ 905,748.70 |
| NORANDA MINES LIMITED, Toronto 1, Ontario | 4.5175 | 90,349 | 22,587 | $ 905,748.70 |
| THOR EXPLORATION CO. LTD. (Ranvik Ship) Montreal 2, P.Q. | 4.5174 | 90,349 | 22,587 | $ 905,748.70 |
| BOCADEL OIL CORPORATION (Barber Oil) Houston, Texas (sole U.S. partner) | 4,5175 | 90,349 | 22,587 | $ 905,748.70 |
| BANKENO MINES LIMITED, Toronto 1, Ontario | 2.2588 | 45,175 | 11,294 | $ 452,879.40 |
| BOW VALLEY INDUSTRIES LTD., Calgary, Alberta | 2.2588 | 45,175 | 11,294 | $ 452,879.40 |
| ANTICLINE PETROLEUMS LTD (Commonwealth Calgary, Alberta (Petroleum | 1.1294 | 22,587 | 5,647 | $ 226,434.70 |
| EXCEL PETROLEUMS LTD. (Services Calgary, Alberta | 1.1294 | 22,587 | 5,647 | $ 226,434.70 |
| CANADIAN CRIDOIL LIMITED, Calgary, Alberta | .9487 | 18,973 | 4,743 | $ 190,204.30 |
| CANADIAN INDUSTRIAL GAS & OIL LTD., Calgary, Alberta | .6776 | 13,552 | 3,388 | $ 135,858.80 |
| CONICK PETROLEUMS LTD. (C. O. Nickle) Calgary, Alberta | .2711 | 5,421 | 1,355 | $ 54,345.50 |
| SCENIC OILS LTD. (Can. Gridoil parent) Calgary, Alberta | .1356 | 2,711 | 678 | $ 27,177.80 |
| ERIC CONNELLY, Calgary, Alberta | .1130 | 2,259 | 565 | $ 22,646.50 |
| TOTAL OR PRIVATE CAPITAL PARTICIPAT. | 55.0000 | 1,100,000 | 275,000 | $11,027,500.00 |
| TOTAL COMMITTMENTS, PRESENT TIME | 100.0000 | 2,000,000 | 500,000 | $20,050,000.00 |

## 2–2.1 EXPLORATION COSTS NORTH OF 60

Oil and gas exploration costs North of 60 vary by location. In general, they are higher than in the settled regions of Canada. (See FIG. 2-1 to 2-4).

Following are average costs of oil and gas exploration in 1968:

### 2–2.1.1 Latitude 60° – 65°

| | |
|---|---|
| Surface Geologic Surveys | $70,000 – $75,000 per month for<br>– a 2 geologic party group (4 geologists)<br>– camp costs<br>– helicopter charter<br>– air support |
| Gravity Meter Surveys | – $2,500 – $4,000 per month if 2 men party attached to seismic crew.<br>– $30 – 40,000 per month if separate, the additional costs include bulldozing or helicopter charter |
| Aeromagnetometer Surveys (includes processing) | – $20 per linear mile – gradiometer type<br>– $10 per linear mile – high sensitivity type<br>– $ 3 per linear mile – flux-gate type |
| Seismic (Reflection only) (Does not include mobilization costs) | – $60 – $75,000 per month plus bulldozing costs. (bulldozing costs vary from $15, – $40,000 per month) Normal production is 40 – 50 miles per month<br>– $3,000 per linear mile may be a reasonable turn-key contract price. |
| Drilling | – Of the 27 wells drilled south of latitude 65° in 1967 average drilling costs varied from $17 – $123 per foot. By eliminating the low and high figure the median averaged out to $46 per foot. The costs include:<br>* move-in and move-out<br>* tangible and intangible costs<br>* preparing well-site<br>* constructing roads<br>* stand-by time if applicable. |
| Roads | – Seismic trails can be cleared for $500 – $1,000 per mile. Roads suitable for moving rigs can be built for $1,000 – $4,000 per mile. (Depending on number of ice bridges to be built) |

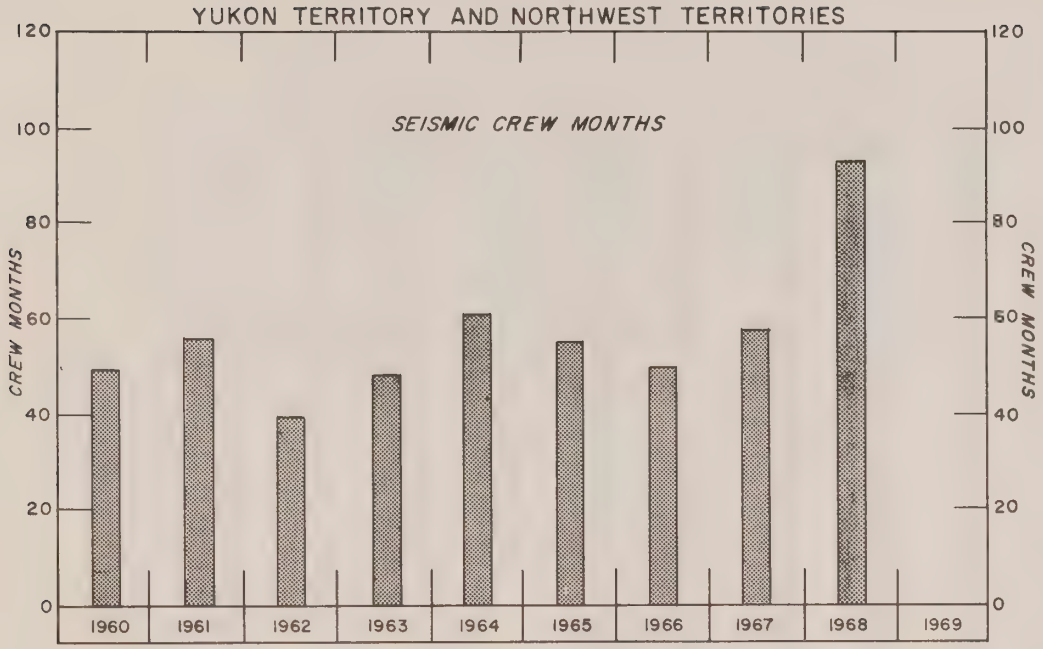
### 2–2.1.2 Latitude 65° – 70°

| | |
|---|---|
| Surface Geologic Surveys | $80,000 per month for<br>– a 2 geologic party group (4 geologists)<br>– camp costs<br>– helicopter charter<br>– air support |

| | |
|---|---|
| Gravity Meter Surveys | – $3,000 – $5,000 per month if 2 men party attached to seismic or surface party.<br>– $35 – $50,000 per month if party operates on their own logistics. This includes bulldozing or helicopter rental. |
| Aeromagnetometer Surveys (includes processing) | – $20 per linear mile – gradiometer survey<br>– $15 per linear mile – high sensitivity type<br>– $ 5 per linear mile – flux-gate aeromagnetometer |
| Seismic (Reflection only) | – $130,000 per crew month includes bulldozing but not mobilization costs.<br>– $200,000 per crew month for short programs which includes bulldozing, mobilization costs and air support.<br>(Normal production about 50-60 miles per crew month) |
| Drilling | – Of the 9 wells drilled north of latitude 65° in 1967 average drilling costs varied from $32 to $236 per foot. By eliminating the lowest and the highest figure, median averages $102 per foot. The costs include<br>*move-in and move-out<br>*tangible and intangible costs<br>*constructing roads<br>*preparing well-site<br>*water transportation<br>*stand-by time when applicable |
| Roads | – Seismic trails can be cleared for $500 per mile. Roads suitable for moving rigs can be built for $1,000 – $4,000 per mile. (Depending on number of ice bridges to be built and logistics) |

*Fig. 2-1*

EXPLORATION ACTIVITY
YUKON TERRITORY AND NORTHWEST TERRITORIES



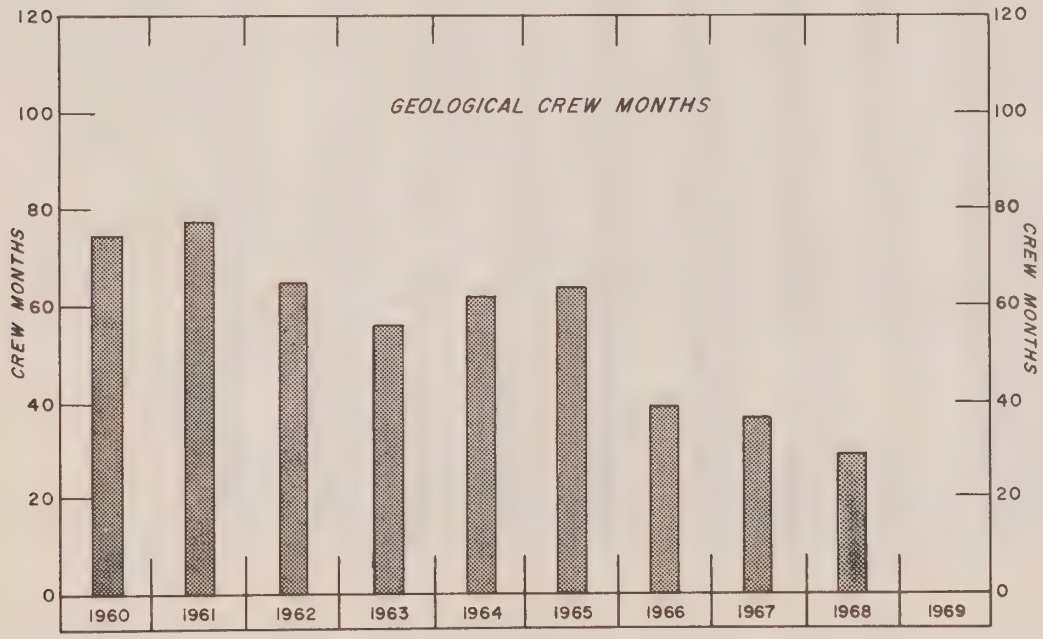



*Fig.* 2-2

OIL & GAS EXPLORATORY EXPENDITURES

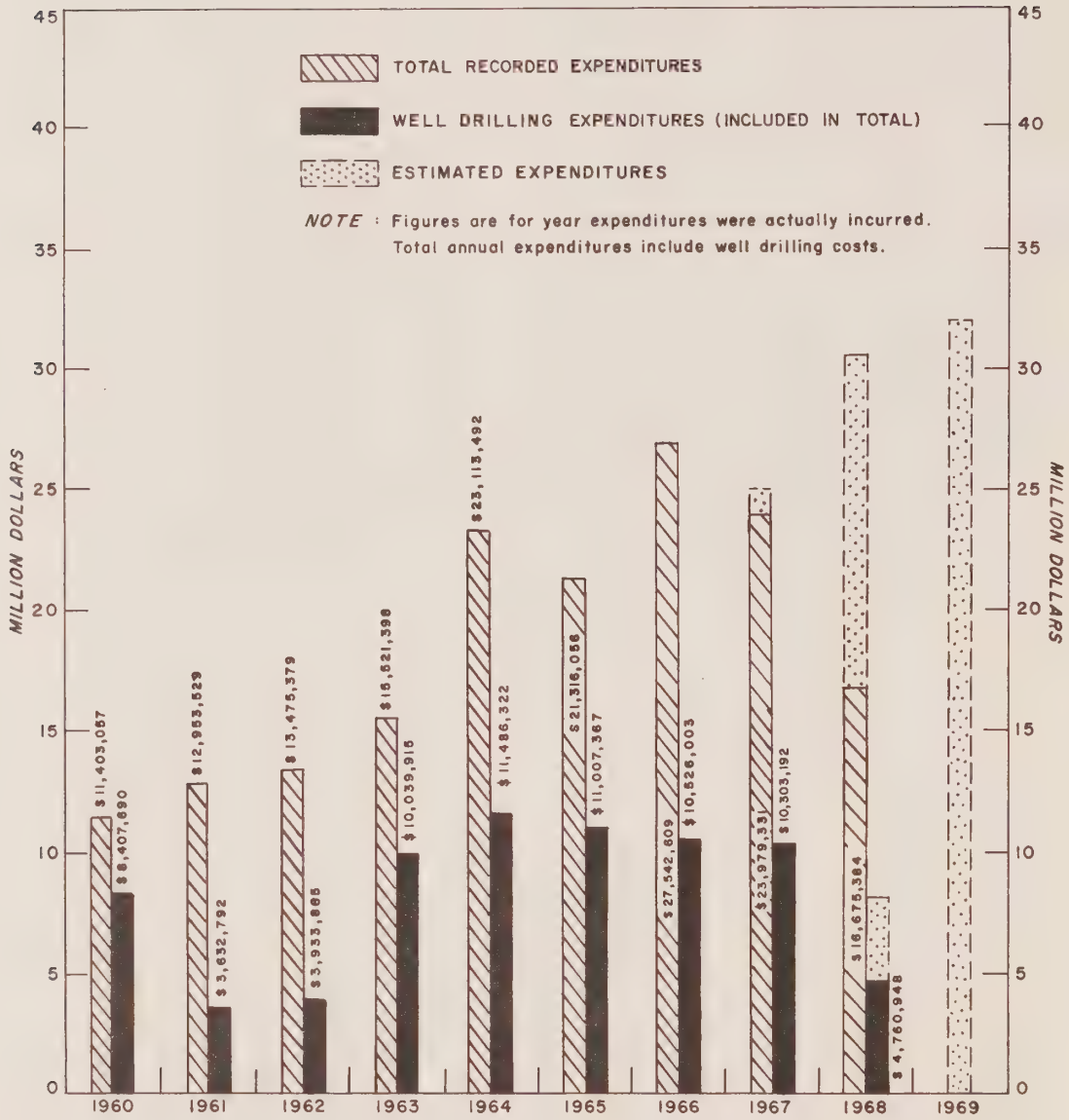
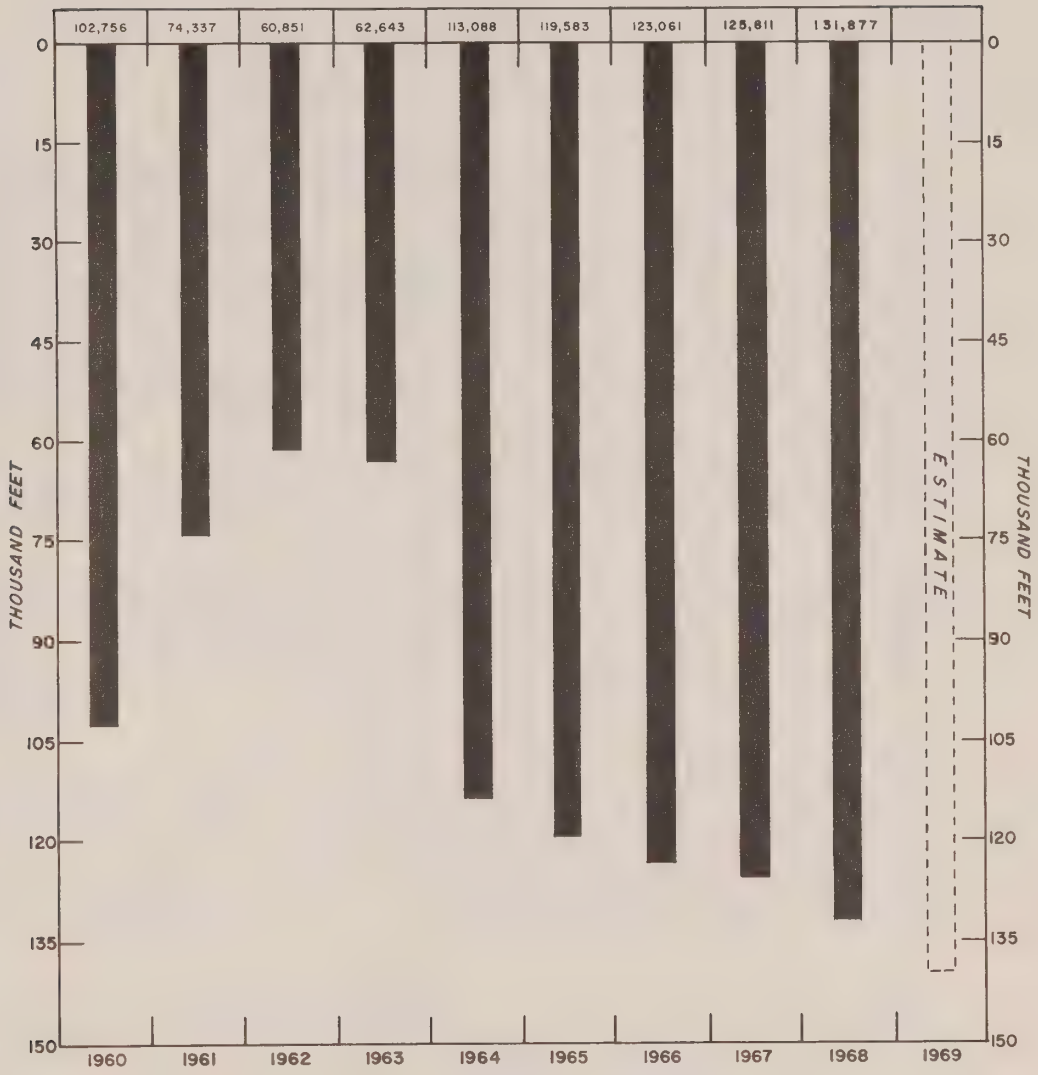


*Fig.* 2-3

FOOTAGE DRILLED

YUKON TERRITORY AND NORTHWEST TERRITORIES



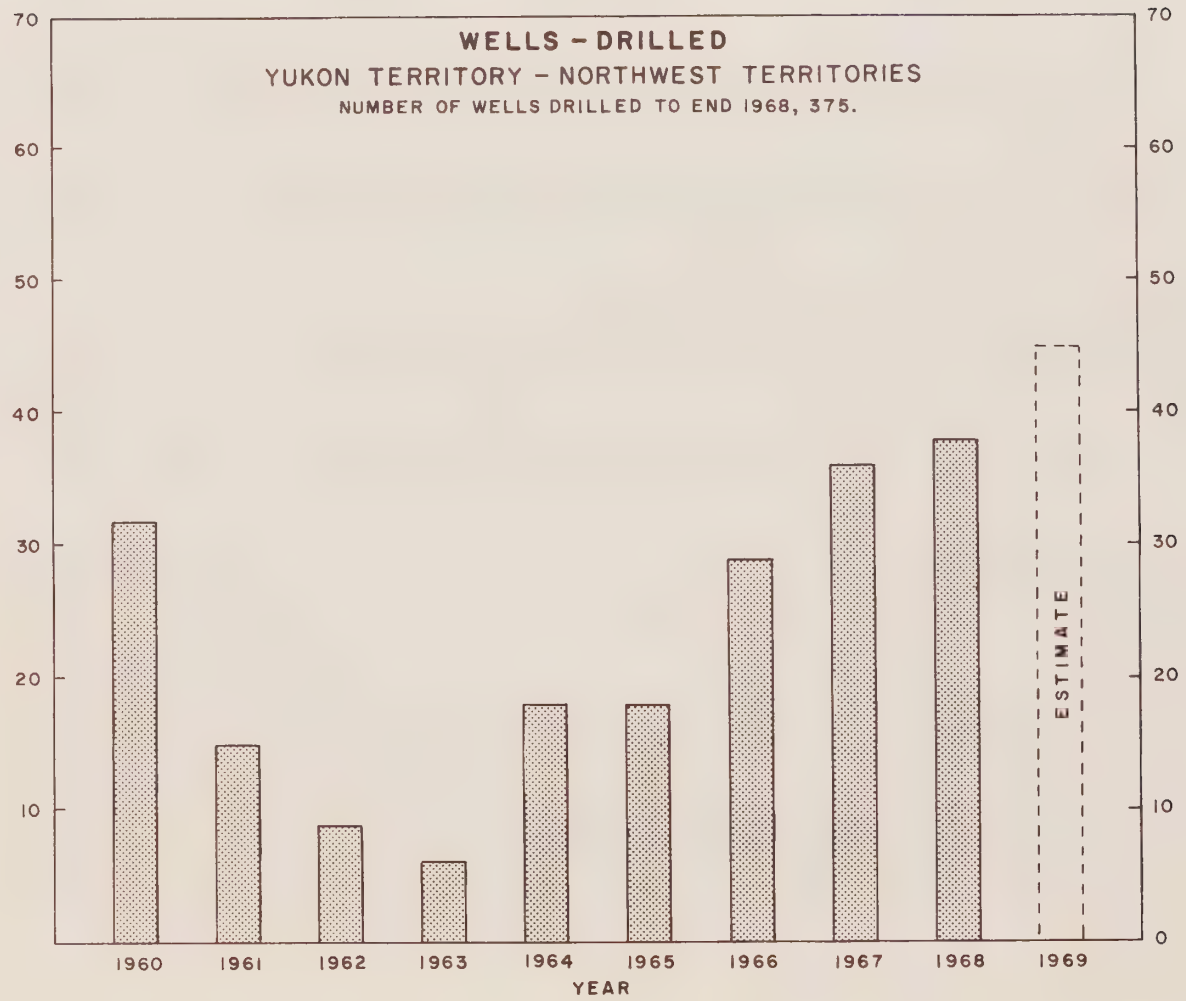

WELLS - DRILLED
YUKON TERRITORY - NORTHWEST TERRITORIES
NUMBER OF WELLS DRILLED TO END 1968, 375.
70
60
50
40
30
20
10
0
ESTIMATE
1960
1961
1962
1963
1964
1965
1966
1967
1968
1969
YEAR

Fig. 2–4

## 2–3.1 SEDIMENTARY GEOLOGICAL PROVINCES

Canada North of 60 can be divided into seven major sedimentary areas: (See Map 2-3).

1. Interior Plains
2. Mackenzie Mountain Area
3. North Yukon Area
4. Arctic Lowlands
5. Franklinian Geosyncline
6. Sverdrup Basin
7. Arctic Coastal Plain

### 2–3.1.1 Interior Plains

This area is part of the large geologic province which covers mainland Canada between the Precambrian Shield and the Cordillera and extends southward into the United States. In the Northwest Territories mainland, this sedimentary area is underlain mainly by horizontal or gently dipping Lower Paleozoic, Devonian, Carboniferous and Cretaceous sediments that thicken southward into northern Alberta and westward into the Cordilleran Geosyncline. Regional unconformities lie at the base of the Paleozoic, Middle Devonian and late Lower Cretaceous.

On the basis of structure and stratigraphy, the Interior Plains North of 60 can be subdivided into three regions, From south to north, these are the Great Slave Plain, the Great Bear Plain and the Anderson Plain-Peel Plain-Peel Plateau region.

Geologically, the Great Slave Plain is the northern extension of areas that are producing oil and gas in the northern parts of Alberta and Brisith Columbia; most of the exploratory drilling North of 60 has been in this area. Small gas discoveries have been made at Rabbit Lake, Netla, Celibeta, Island River, Trainor Lake, Bovie Lake and Cameron Hills.

As a result of this drilling, the general geology is known. Strong topographic relief characterizes the surface of the Precambrian crystalline basement. These irregularities are partly infilled by porous Cambro-Ordovician sandstones. Overlying this is a sequence of Middle Devonian carbonates part of which is biogenic in origin and gives way laterally to evaporites. The gas discoveries have been in these carbonates which are an extension of the gas reservoir belt of northeastern British Columbia. The section above the Middle Devonian comprises shales with a few carbonate interbeds.

The Great Bear Plain is a west-dipping homocline of Ordovician, Silurian and Middle Devonian carbonate extensively exposed or overlain by a thin veneer of Cretaceous shale. North-trending uplifts which merge with the Franklin Mountains bring Ordovician, Silurian and Middle Devonian rocks to the surface.

The Anderson Plain is underlain by a west-dipping homocline that extends into the basin beneath the Peel Plain and Peel Plateau. The Cambrian rocks are predominantly shallow water, marine beds deposited under conditions of arid climate and restrictive circulation. They grade from porous sands and red beds in the east to red beds and salt in the central area to varicolored shale, gypsum and limestone in the west. The Ordovician and Silurian are a thick, partly porous dolomite which undergoes a facies change to shale on the west side of the Peel Plateau. Overlying this is a middle Devonian carbonate which passes eastward into evaporites and breccias and westward into shale and is in turn overlain by a cover of shale with some sandstone ranging in age from Upper Devonian to Upper Cretaceous.

### 2–3.1.2 Mackenzie Mountain Area

The Mackenzie Mountain Area embraces the Mackenzie and Franklin Mountains as well as two potential petroleum provinces, the Liard Plateau and the Mackenzie Plain. In the Liard Plateau, the valleys are synclines while the hills are complex folded and faulted anticlinal features with several doubly-plunging linked culminations. Deformation is considered to be Laramide.

Large quantities of gas have been found in a thick sequence of Middle Devonian carbonates where it occurs buried in the culminations of such structures at Beaver River and at Pointed Mountain under a cover of Upper Devonian and Carboniferous shales and sandstones.

Much of the Mackenzie Plain is characterized by extensive linear synclines and broad gentle anticlines, commonly linked en echelon and broken by faults of small displacement.

Porosity is known to be present in several horizons in the Mackenzie Plain. The Ordovician and Silurian beds are a thick, partly porous dolomite and the Middle Devonian breccias also carry porosity although some anhydrite plugging is known. The Upper Devonian Kee Scarp limestone and reefs underlie the northern part of the Mackenzie Plain and are the reservoir rock at the Norman Wells oilfield. Such reefs occur at the top of an extensive platform of bedded limestone and may reach several hundred feet in thickness.

### 2–3.1.3 Northern Yukon Area

The Northern Yukon Area includes a complex of varied structural trends surrounding the Old Crow Plain, Eagle Plain, and Arctic Plateau.

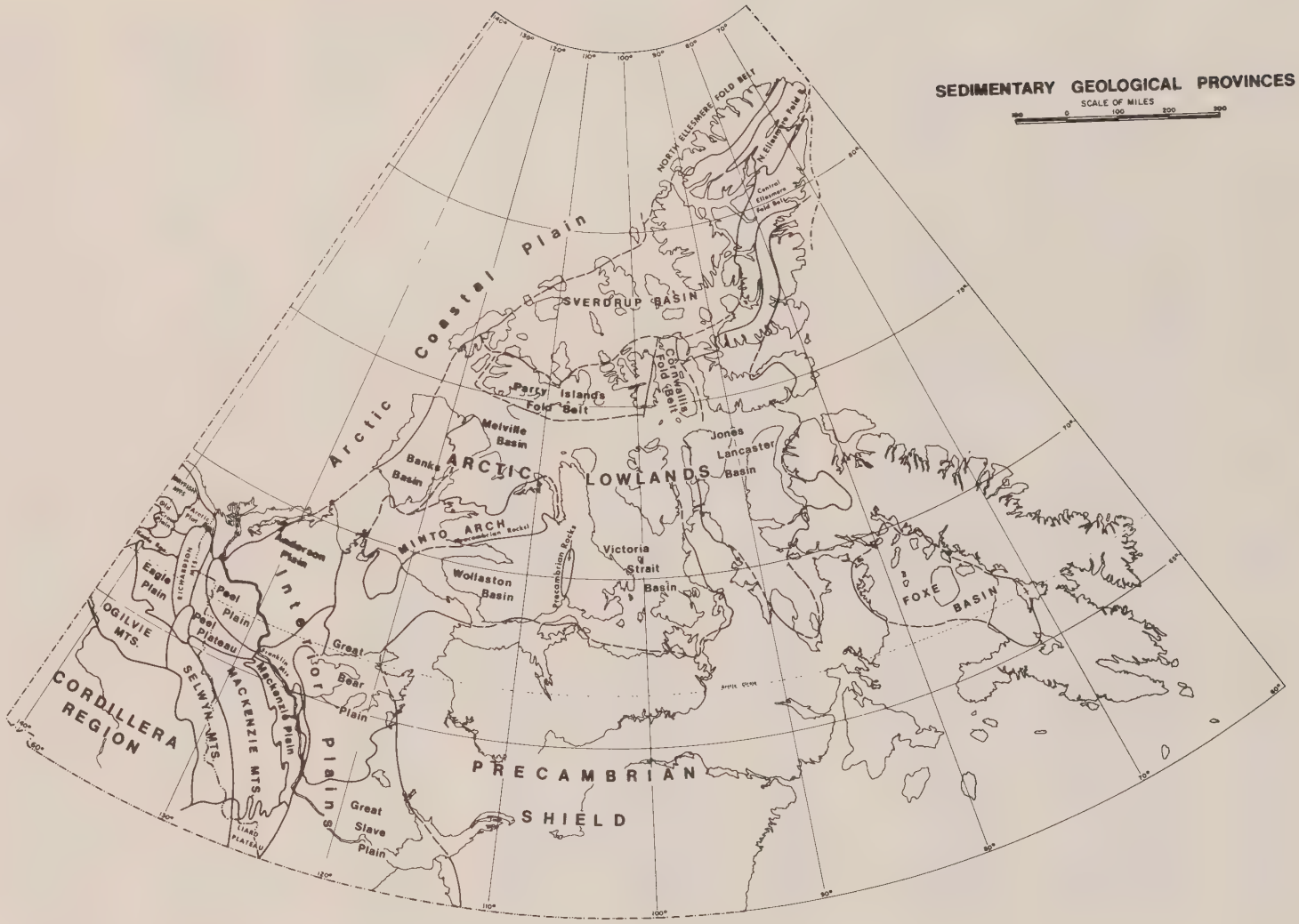
The Old Crow Plain has a cover of Quaternary and Tertiary sediments and little is known of the underlying section. The area is flanked on the south by metasediments and granites and on the other sides by Devonian carbonate and Jurassic and Lower Cretaceous clastics.

Most of the Arctic Plateau beneath the cover Jurassic and Cretaceous shales and sandstones may be floored by low-grade metamorphic rocks. Mississippian limestones and Triassic sandstone intervene in the southwest and Permian, Carboniferous and possibly Devonian clastics occur in the northeast.

The Eagle Plain is a rectangular structural basin framed by areas of complex structure. These are the Richardson Mountains to the east, the Dave Lord Ridge to the north, and the Ogilvie Mountains to the west and south. Around the periphery of the basin the structures trend parallel to the adjacent areas while in the central area, they comprise north-trending, broad, open folds.

Sixteen wells including five completion have been drilled in the Eagle Plain and the stratigraphy, based on data from these as well as the adjacent mountains, is well known. Overlying Cambrian siltstones and sandstones is a series of carbonates ranging in age from Ordovician to Middle Devonian that change facies to shale. This series is overlain by a thick sequence of Upper Devonian to Cretaceous shales and sandstones.

The five wells that were completed encountered hydrocarbons in the Permo-Carboniferous part of this sequence. One of these wells, the Western Minerals Chance No. 1 oil and gas well, was the first successful test drilled in the Yukon.


SEDIMENTARY GEOLOGICAL PROVINCES
SCALE OF MILES
Arctic Coastal Plain
SVERDRUP BASIN
NORTH ELLESMERE FOLD BELT
N. Ellesmere Fold
Central Ellesmere Fold Belt
Parry Islands Fold Belt
Cornwallis Fold Belt
Melville Basin
Banks Basin
ARCTIC LOWLANDS
Jones Lancaster Basin
MINTO ARCH
Precambrian Rocks
Victoria Strait Basin
Wollaston Basin
FOXE BASIN
Eagle Plain
OGILVIE MTS.
RICHARDSON MTS.
Peel Plain
Peel Plateau
Anderson Plain
Interior Plains
Great Bear Plain
Mackenzie Plain
SELWYN MTS.
MACKENZIE MTS.
CORDILLERA REGION
Great Slave Plain
PRECAMBRIAN SHIELD

MAP NO. 2–3

### 2–3.1.4 Arctic Lowlands

The Arctic Lowlands are divided by salients and inliers of Precambrian rocks into six basins: Victoria Strait Basin, Jones – Lancaster Basin, Melville Basin, Wollaston Basin, Foxe Basin, and the Banks Basin.

Porous Cambrian sandstones are present in some areas but the principal rocks of the Lowlands are limestones and dolomites that range in age from Middle Ordovician to Lower Devonian. Of these, the Cornwallis and Allen Bay dolomites are characterized by reefoid developments, vuggy porosity and bituminous residues. They are widely exposed in southerly regions of the Lowlands but are covered by Silurian to Lower Devonian limestones in the north and by beds as young as Tertiary in the west.

In the Melville Basin the Silurian is overlain by limestones and bituminous shales of the Middle Devonian Blue Fiord Formation. Thick Middle to Upper Devonian shales and sandstones constitute a cover. Isolated Upper Devonian reefs also occur and the trend may extend westward beneath the Cretaceous and Tertiary clastics of the Banks basin.

### 2–3.1.5 Franklinian Geosyncline

The Franklinian Geosyncline embraces miogeosynclinal rocks included in the Parry Islands, Cornwallis and Central Ellesmere Fold Belts, and rocks of eugeosynclinal character included in the Northern Ellesmere Fold Belt.

The Cornwallis Fold Belt is characterized by north-trending closely-folded anticlines separated by broad shallow synclines. Dome-like structures occur in the narrow margin where the north-trending folds are in conjunction with the east-trending folds of the Parry Islands Fold Belt.

Two wells have tested structures within this belt. Lobitos et al Cornwallis Resolute Bay L-41 was abandoned in December 1963 at 4840 feet after encountering porous, water-saturated carbonates in the Ordovician Cornwallis Formation.

Dominion Explorers – Canso et al Bathurst Caledonian R. J-34, which drilled on a dome-like structure on the western edge of the Cornwallis Fold Belt was abandoned in February 1964 at 10,000 feet. The well spudded in the Silurian and drilled 6700 feet of interbedded shales and carbonates followed by 3300 feet of an evaporitic sequence containing anhydrite, some salt, shale and dolomite.

Structures of the Parry Islands Fold Belt are long, sublinear, symetric, gently-plunging east-trending folds which gradually decrease in amplitude southward toward the Arctic Lowlands. Dome et al Winter Harbour No. 1, the first well drilled in the Arctic Islands, tested such a structure. The well encountered small pockets of gas and was abandoned at 12,543 feet in March, 1962.

The Central Ellesmere Fold Belt embraces a region of northeasterly trending folds and thrusts produced by Varisian and Laramide orogenies. In the southerly regions Variscan structures are broad open folds and Laramide tectonism appear to have been moderate. Both Variscan and Laramide structures are more intense in the north.

The Northern Ellesmere Fold Belt includes metamorphosed Precambrian eugeosynclinal rocks as well as acidic and basic intrusions.

Within the Franklinian geosyncline, a thick sedimentary sequence ranging in age from Ordovician to Devonian is present. The Ordovician, Silurian and Lower Devonian carbonates that underlie the Arctic Lowlands thicken northward into the geosyncline and grade into graptolitic shale.

The Ordovician Cornwallis Formation is very thick and extensive on Ellesmere Island and isolated outcrops occur within the Parry Island Fold Belt. The upper part contains recfroid dolomites on Cornwallis and Bathurst Islands but is dense on Melville Island where it grades into shale.

The Upper Ordovician-Silurian Allen Bay Formation includes several zones of coarsely crystalline porous dolomite. The overlying Read Bay Formation is mainly dense but the upper part includes biogenic, reefoid, and porous limestones. The facies change between these formations and the Cape Phillips shale is generally abrupt with several thousand feet of carbonate passing into shale within a few miles but on Cornwallis Island tongues of porous dolomite up to 100 feet thick extend 30 or 40 miles beyond the front.

On Ellesmere Island a carbonate bank occurs surrounded entirely by Cape Phillips clastics and similar banks are also known on Melville Island,

Potential Lower Devonian reservoirs are limestone and small bioherms of the upper Read Bay Formation and Sherard Osborn Formation. The Middle Devonian comprises mainly bedded carbonates with local biogenic and reefoid beds. The Lower and Middle Devonian carbonates also pass into shale.

The youngest rocks known in the Franklinian Geosyncline are late Middle Devonian shales and dense siltstones and Upper Devonian sandstone and shale, mainly non-marine in origin.

**2-3.1.6 Sverdrup Basin**

The Sverdrup Basin contains a thick sequence of late Paleozoic to early Tertiary strata that lie with profound unconformity on deformed older Paeozoic beds. The section may be as much as 40,000 feet thick.

Laramide folding and thrusting affected much of the Sverdrup Basin being most intense in the northeast part. West of the Ringnes Islands deformation is less intense, dips are generally less than five degrees, and the structure is a northeast plunging synclinorium with gentle folds radiating from the axis.

The Laramide strike is closely related to older Paleozoic deformations. On west-central Ellesmere Island Laramide structures parallel the Variscan trend and folds on much of the Axel Heiberg Island are aligned with those of the Caledonian and Variscan. These older belts appear to have produced differential rates of subsidence during the Mesozoic.

In the axial part of the basin there are at least two units of anhydrite, one of Carboniferous age and the other Permian. The evaporites intruded the overlying Mesozoic and Tertiary beds as domes, in diapiric folds, and along faults. Available evidence suggests that the lower evaporite is the principal source. No halite has been found either in the intrusives or where the evaporites are known in situ.

In eastern Sverdrup Basin, where the Triassic forms the exposed core of many folds, Pennsylvanian and Permian rocks constitute the potential reservoirs. The thick

succession on Ellesmere Island includes limestone banks, locally reefoid and isolated reef masses capped by black shale. The limestones grade westward into a thin shale and siltstone sequence constituting the axial part of the basin and eastward to marginal facies of sandstone and conglomerate.

Mesozoic sedimentation is characterized by basinal marine shales and siltstone with partly porous marine sandstone intertonguing from the east and south margins and at some horizons from the northwest also. Tar sands are present in the basal part of the Triassic Bjoine Formation on Melville Island.

Gabbro sills and dykes intrude formations as young as Upper Cretaceous in the eastern part of the Sverdrup basin. Individual sills attain a thickness of 300 feet and adjacent strata may be metamorphosed to a distance of about 80 feet. The presence of numerous basic intrusives may not be entirely an adverse feature as they could produce effective traps on the flanks of folds.

### 2–3.1.7 Arctic Coastal Plain

This broad geologic province covers the northwestern part of North America and much of it lies beneath the Beaufort Sea. The Canadian land portion includes parts of Banks and Prince Patrick Island and the northern parts of the outer Canadian Arctic Islands as well as a 10 to 20 mile wide strip of gently rolling terrain on the western part of the north coast, north of the Interior Plains and North Yukon Areas. The Arctic Coastal Plain is through-going into Alaska where the land portion widens to 150 miles because of the divergence between the mountainous chain which marks the southern boundary of the area and the seacoast.

Bedrock in the Arctic Coastal Plain is late Tertiary or Pleistocene non-marine sands and gravels. From drilling in the Mackenzie Delta and Alaska it is known that beneath the cover lie non-marine Cretaceous beds which are underlain, in turn, by marine clastics of the Cretaceous, Jurassic and Triassic. An unconformity separates these rocks from the shales and limestones of the Carboniferous Lisburne Formation. Middle and Lower Paleozoic rocks are exposed in the mountainous areas south of the Arctic coastal Plain but it is doubtful that these extend very far north. The Carboniferous and Triassic are oil and gas reservoirs at the major discovery at Prudhoe Bay in Alaska.

The alluvium cover masks the structural geology of much of the area. In Alaska, long north-northwest trending anticlinal structures of Laramide origin have been mapped. The Prudhoe Bay discovery is on one of these.

Submarine scarps, also with a north-northwest alignment have been mapped in the Mackenzie Bay area and normal faults of small displacement occur on Prince Patrick Island.

The early history of the Mackenzie Delta is unknown. Fault scarps are present on the east and west sides suggesting that it may have been a graben for at least a part of its history. The B.A. Shell IOE Reindeer D-27 well bottomed in sediments believed to be Jurassic at 12,668 feet proving the presence of a thick Cenozoic-Mesozoic sequence, regardless or origin. Some good shows of oil were encountered in samples and a small amount of gas was recovered on drillstem test.

## 2–4.1 – GOVERNMENT SERVICES AND REQUIREMENTS

All aspects of oil and gas operations in the Yukon and the Northwest Territories are administered by the Oil and Gas Section, Oil and Minerals Division, Northern Economic Development Branch, Department of Indian Affairs and Northern Development, Ottawa.

It is the intent of the Department to provide a regulatory climate that will best encourage and provide for the orderly exploration and exploitation of oil and gas North of 60.

### 2–4.1.1 Oil and Gas Regulations

Regulations in effect for oil and gas administration are made pursuant to the Territorial Lands Act, and Public Lands Grants Act.

They include:

* Canada Oil and Gas Land Regulations
* Oil and Gas Land Order No. 1 – 1961
* Oil and Gas Land Order No. 2 – 1961
* Oil and Gas Land Order No. 1 – 1962
* Oil and Gas Land Order No. 2 – 1962 (amended)
* Canada Oil and Gas Drilling and Production Regulations

### 2-4.1.2 The Canada Oil and Gas Land Regulations

These regulations came into effect June 6, 1961. The Regulations provided for an applicant to select a grid area from a master map held in the Oil and Minerals Division showing all grid areas already under permit and those still available. An applicant may apply for any grid area which is available for filing and be granted a permit entitling him to explore for oil and gas (See Maps 2-4 to 2-6, Fig. 2-5).

The applicant shall pay a fee of $250.00 per permit and deposit money, bonds, or a promissory note to guarantee that exploratory work required during the life of the permit is $2.90 per acre on the mainland, $2.65 per acre for the Arctic Islands and $2.70 for water permits. The work expenditure requirement commences at five cents per acre and escalates to 50 cents per acre during the term of the permit.

If the permittee considers it necessary to evaluate adjacent areas as well as his own permits, he may be permitted to carry out this exploration regardless of whether the areas are open or have been allotted to another permittee. The deposits, which are required to ensure work, are returned upon satisfactory performance.

Permits on the mainland are valid for three, four or six years depending on location with six renewals of one year each. Marine permits under seacoast waters are valid for six years with six renewals of one year each; north of latitude 70° all permits issued prior to 1968 are valid for eight years with six renewal terms. Permits issued in 1968 and later are valid for six years with six renewal periods.

A permittee may acquire leases comprising in aggregate, not more than 50 per cent of the sections in each grid or half-grid for which he has a permit. The minimum size for leases is one section, and the maximum sizes are five sections by three sections or four sections by four sections. Leases are valid for 21 years and are renewable. The rental is 50 cents per acre for

the first year, and in the second and subsequent years is $1.00 per acre. Up to 50 per cent of the annual rental can be in the form of unallocated work expenditures carried forward from the permit stage, and these surpluses may be credited against the rental until the expiration of the lease or until the start of commercial oil or gas production.

The 50 per cent of the permit not acquired under lease by the permittee returns to the Crown.

On October 12, 1961, two Oil and Gas Land Orders were issued granting the permittee an option to acquire the Crown's portion on the payment of an additional royalty which varies with location and production rates (See map 2-7).

If the option is not exercised, the lands returned to the Crown may be sold by tender as oil and gas leases by one of three methods: – cash bonus, work bonus or cash bonus plus and undertaking to drill a well to a specified depth.

On September 17, 1962, a third land order was issued setting out methods for disposal by permit of lands returned to the Crown. The methods to be used are sale by tender of single permits or blocks of permits for a work bonus or a cash bonus.

On December 22, 1964, Oil and Gas Land Order No. 2 – 1961 was amended to provide for lessees to deposit with the Chief, money, bonds, or an approved note of a value equal to the amount that the lessee undertakes to expend for exploration work on the lease area within one or more fixed periods. (See Figs. 2-6 to 2-9)

Safety inspections of all oil well drilling rigs is carried out by the Inspection Services Unit of the Department of Indian Affairs and Northern Development.

**2–4.1.3 Exploration Requirements and Federal Services**

Following are the requirements of the various federal agencies involved and the services that are available through these agencies for those companies engaged in oil and gas exploration activities North of 60:

**2–4.1.4 Department of Indian Affairs and Northern Development**

Pursuant to Section 52 of the Canada Oil and Gas Land Regulations notice of commencement of exploratory work must be filed 15 days prior to commencement of proposed programs on the mainland and Arctic Islands, and 45 days prior to commencement of exploratory work on offshore areas.

Notice is filed with:

Oil Conservation Engineer,
Oil and Mineral Division
Department of Indian Affairs
and Northern Development,
3303 – 33rd St. N.W.,
Calgary, Alberta  Phone 403 – 284-2201

For information concerning wildlife sanctuaries and related matters:

Executive Director,
Canadian Wildlife Service,
Department of Indian Affairs and


PERMIT TERM WORK REQUIREMENTS
SCALE OF MILES
100 0 100 200 300
PERMIT TERM 12 YEARS
WORK REQUIREMENT $2.65/Ac.
MARINE PERMIT TERM 12 YEARS
WORK REQUIREMENT $2.70/Ac.
PERMIT TERM 12 YEARS
WORK REQUIREMENT $2.90/Ac.
PERMIT TERM 10 YEARS
WORK REQUIREMENT $2.90/Ac.
PERMIT TERM 9 YEARS
WORK REQUIREMENT $2.90/Ac.

MAP NO. 2–4

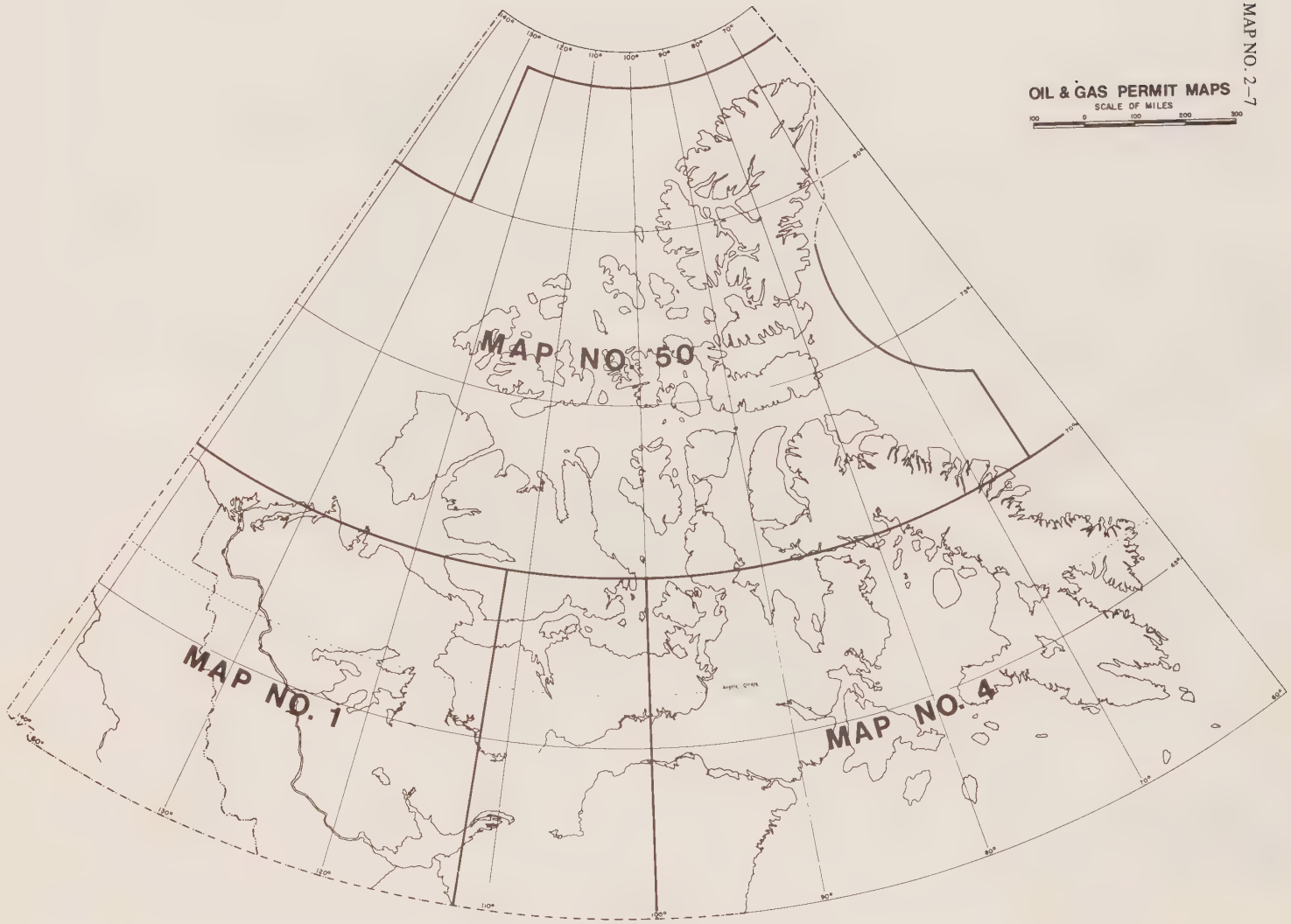
MAP NO. 2–5

ADDITIONAL ROYALTY RATES
BY AREAS

SCALE OF MILES


AREAS UNDER
OIL AND GAS PERMIT
SCALE OF MILES
100 0 100 200 300
Yukon
Territory
NORTHWEST TERRITORIES

MAP NO. 2–6




OIL & GAS PERMIT MAPS

SCALE OF MILES

100 0 100 200 300

MAP NO. 2–7

*Fig.* 2-5
ILLUSTRATING

# PERMIT TERMS AND DEPOSIT REQUIREMENTS PER ACRE

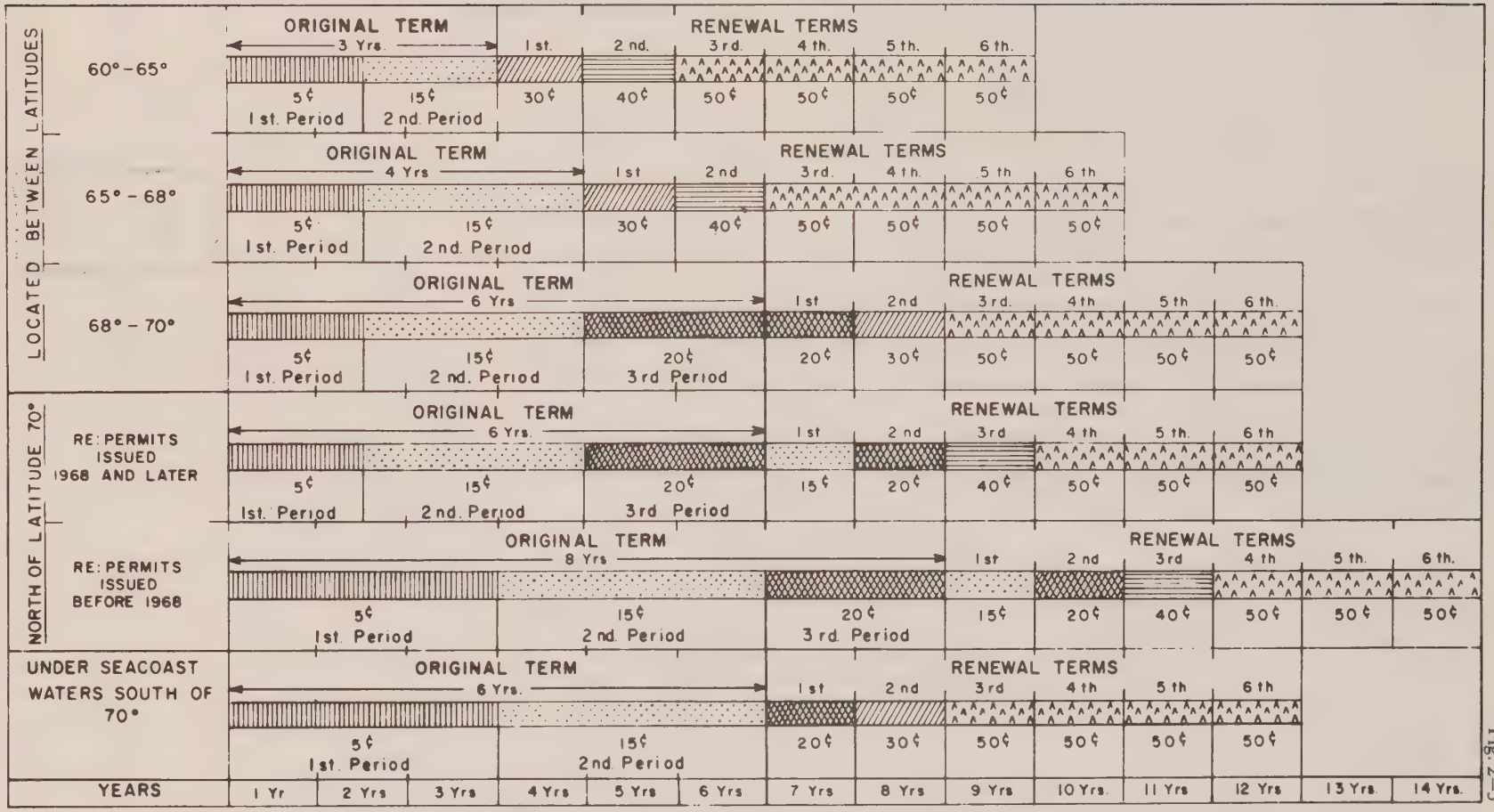


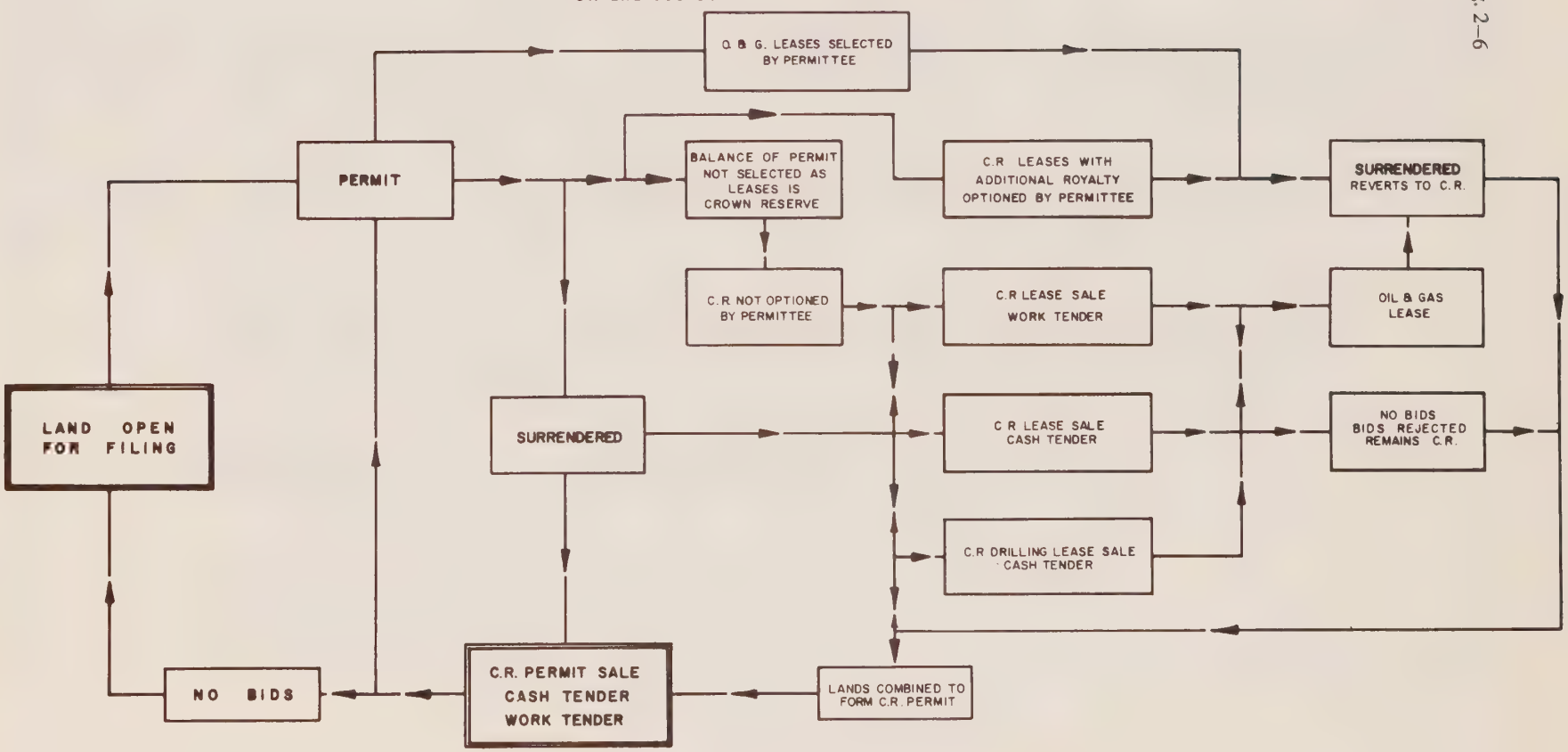

Fig. 2-5

*Fig.* 2–6

FLOW CHART SHOWING METHODS OF OIL & GAS LANDS DISPOSAL

YUKON TERRITORY AND NORTHWEST TERRITORIES

Oil and Gas Section – Oil and Mineral Division




*Note:* C.R." means Crown Reserve, a term applied to Oil and Gas Lands available for acquisition by tender only.

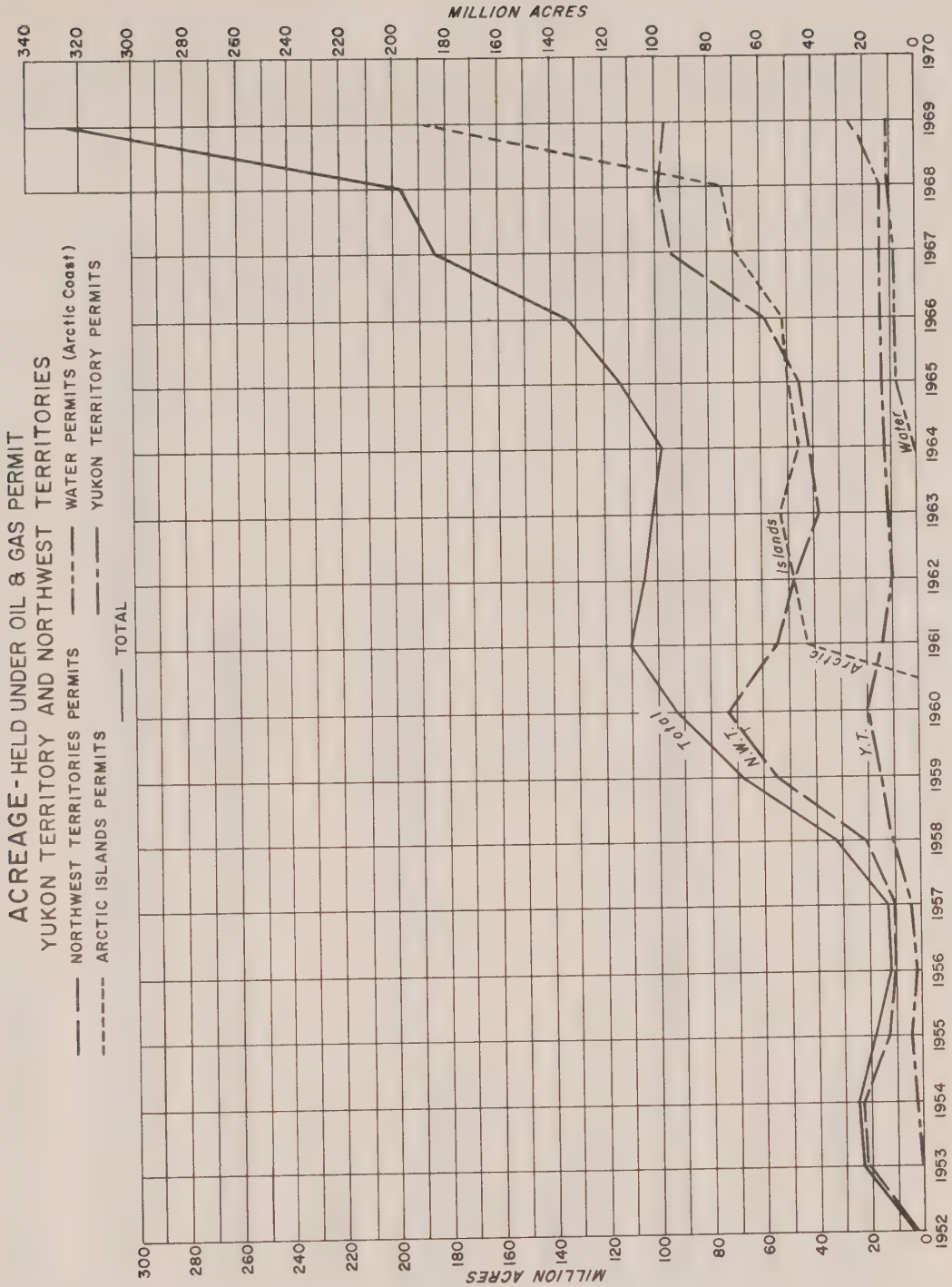


Fig. 2-7
ACREAGE - HELD UNDER OIL & GAS PERMIT
YUKON TERRITORY AND NORTHWEST TERRITORIES
NORTHWEST TERRITORIES PERMITS
ARCTIC ISLANDS PERMITS
TOTAL
WATER PERMITS (Arctic Coast)
YUKON TERRITORY PERMITS
MILLION ACRES
Total
N.W.T.
Islands
Arctic
Y.T.
Water
1952
1953
1954
1955
1956
1957
1958
1959
1960
1961
1962
1963
1964
1965
1966
1967
1968
1969
1970

Fig. 2–8

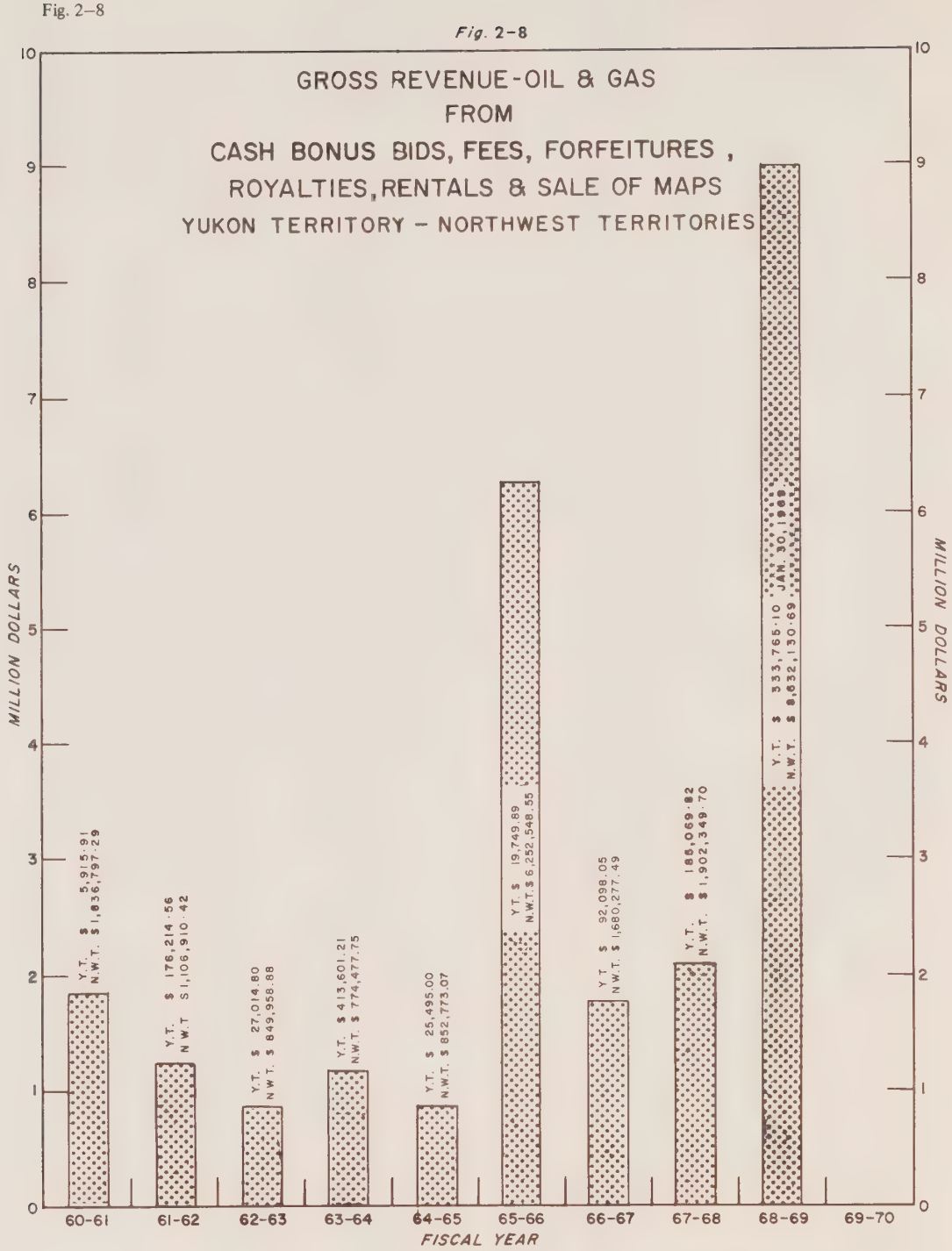
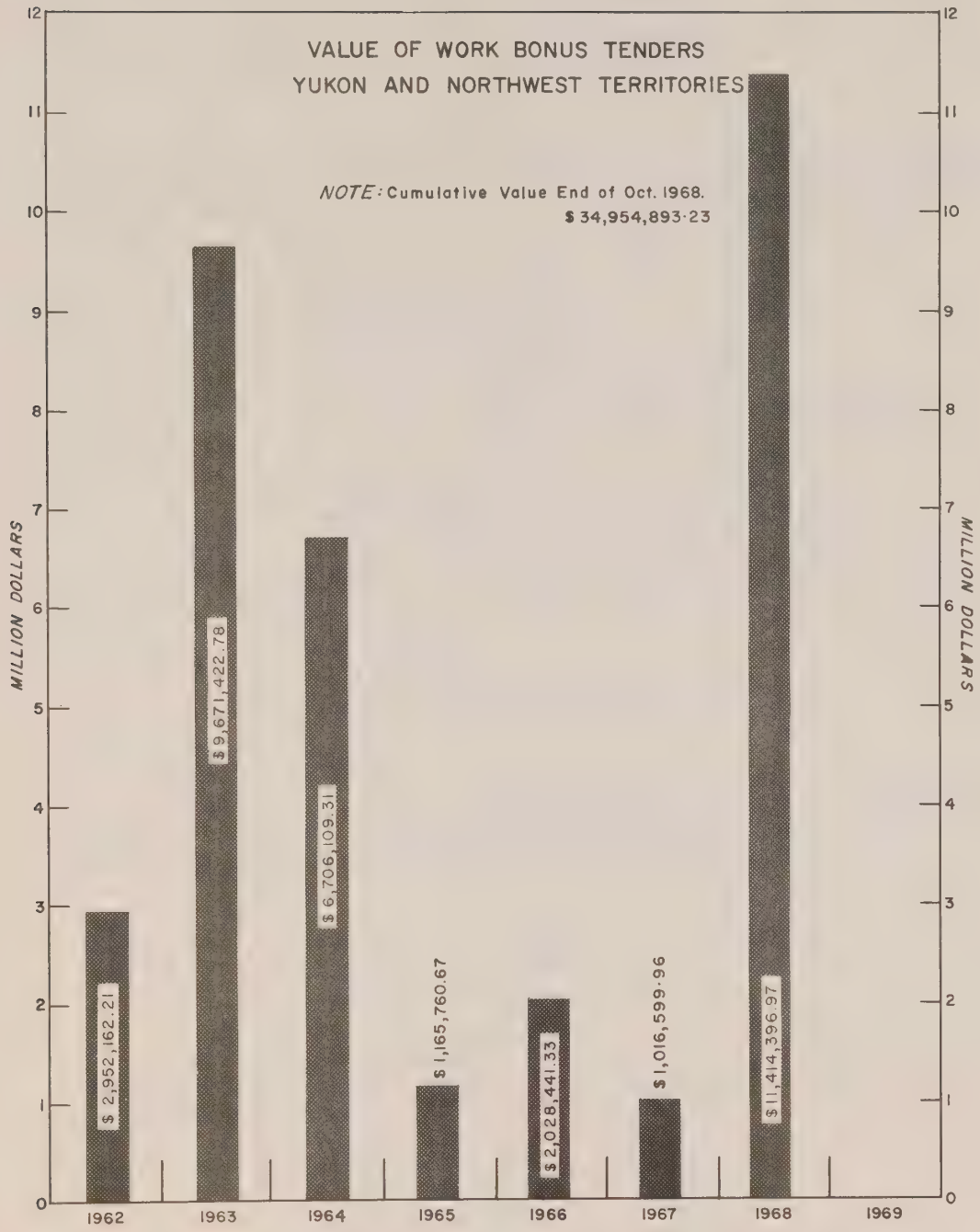


Fig. 2-8
GROSS REVENUE-OIL & GAS
FROM
CASH BONUS BIDS, FEES, FORFEITURES,
ROYALTIES, RENTALS & SALE OF MAPS
YUKON TERRITORY - NORTHWEST TERRITORIES
MILLION DOLLARS
Y.T. N.W.T. $ 5,915·91 $1,836,797·29
Y.T. $ 176,214·56 N.W.T $1,106,910·42
Y.T. $ 27,014.80 N.W.T. $ 849,958.88
Y.T. $ 413,601.21 N.W.T. $ 774,477.75
Y.T. $ 25,495.00 N.W.T. $ 852,773.07
Y.T. $ 19,749.89 N.W.T. $ 6,252,548.55
Y.T $ 92,098.05 N.W.T. $ 1,680,277.49
Y.T. $ 188,069·82 N.W.T. $ 1,902,349·70
Y.T. $ 533,765·10 N.W.T. $ 8,632,130·69
0
1
2
3
4
5
6
7
8
9
10
60-61
61-62
62-63
63-64
64-65
65-66
66-67
67-68
68-69
69-70
FISCAL YEAR

Fig. 2–9


VALUE OF WORK BONUS TENDERS
YUKON AND NORTHWEST TERRITORIES
NOTE: Cumulative Value End of Oct. 1968.
$ 34,954,893·23
MILLION DOLLARS
$ 2,952,162.21
$ 9,671,422.78
$ 6,706,109.31
$ 1,165,760.67
$ 2,028,441.33
$ 1,016,599·96
$ 11,414,396.97
1962
1963
1964
1965
1966
1967
1968
1969
0
1
2
3
4
5
6
7
8
9
10
11
12

Northern Development,
Ottawa, Ontario. Phone 613 – 992-3229

**2–4.1.5 Department of Fisheries**

Resource Development Service

Ninety days' notice in advance is required before the start of marine seismic surveys, in case a qualified observer may be required. Notification should be sent to the Regional Director with a copy to:

Director,
Resource Development Service,
Department of Fisheries,
Ottawa, Ontario. Phone 613 – 997-4044

Information regarding the Department's requirements can also be obtained from:

Assistant Director,
Resource Development Service. Phone 613 – 997-4526

Regional Director responsible for all fresh water lakes in the Yukon and the Northwest Territories:

R.N. Gordon,
114 Garry Street,
Winnipeg 1, Manitoba. Phone 204 – 946-8101

**2–4.1.6 Department of Transport**

The Aids to Navigation Division administers the Navigable Waters Protection Act. Parts I & II, and as such requires at least two months notice in advance of commencing work on offshore areas. Communications should be directed to:

Chief,
Aids to Navigation Division,
Department of Transport,
Ottawa, Ontario Phone 613 – 992-2736

The Meteorological Branch compiles data regarding weather and ice conditions, including information obtained from orbitting satellites. This data is available to exploration companies through:

Liaison Meteorologist,
Department of Transport,
No. 3 Temporary Building,
Ottawa, Ontario. Phone 613 – 992-4217

Information on Arctic Weather stations can also be acquired from:

Meteorological Branch,
Department of Transport,
Mackenzie King Building,
Toronto, Ontario. Phone 416 – 369-4932

Requirements and services of the Radio Regulation Division are available through:

Controller,
Radio Regulations Division,
Department of Transport,
Ottawa, Ontario. Phone 613 – 992-0840

or through:

Superintendent of Radio Authorization, and Enforcement,
Radio Regulations Division. Phone 613 – 992-3427

**2–4.1.7 Department of National Revenue, Customs and Excise Division**

All communications with respect to this agency should be addressed to:

Director,
Customs and Excise Division,
Port Administration Branch,
Department of National Revenue,
Ottawa, Ontario. Phone 613 – 992-2742

Attention: Commercial Operations Section

**2–4.1.8 Department of Manpower and Immigration**

Enquiries should be directed to:

Department of Manpower and Immigration,
Canada Immigration Division,
Admission Section,
Ottawa, Ontario. Phone 613 – 992-3305

The Calgary office of the Department of Immigration can answer any queries regarding entry into the Northwest Territories. The Vancouver office is responsible for entry into the Yukon Territory. At Tuktoyaktuk, NWT, a local Royal Canadian Mounted Police officer is also a representative of the Department of Manpower and Immigration and can clear entry into Canada via Tuktoyaktuk.

At Inuvik, NWT, the Customs Department has a Department representative and he can be contacted by telephone if prior arrangements are necessary.

**2–4.1.9 Department of National Defence**

Notification of off-shore operations in the Pacific or Western Arctic should be filed with:

The Flag Officer,
Maritime Commander (Pacific),
Victoria, British Columbia.

General enquiries can be directed to:

Chief of Defence Staff.

Phone 613 – 992-4248
Attention: Directorate of Operations, Ottawa, Ontario.

## 2–5.1 PUBLICATION SOURCES

Information on technical detail, maps, exploration and development work on oil and gas North of 60 is available from a number of sources in Ottawa and elsewhere. Following is a list of materials and their sources.

### 7.1.1 Schedule of Wells

The following publications are available from the Queen's Printer, Ottawa, or from any Government bookstore, and from the Oil Conservation Engineer, Department of Indian Affairs and Northern Development, 3303 – 33rd St. N.W., Calgary, Alta. Pre-payment is requested for all publications for which there is a charge, cheques or money orders are to be made payable to the Receiver General of Canada.

| | |
|---|---|
| a) Schedule of Wells, 1920 – 1960 | $3.00 |
| b) Schedule of Wells, 1920 – 1961 | 4.00 |
| c) Schedule of Wells, 1920 – 1963 | 4.00 |
| d) Schedule of Wells, 1962 – 1964 | 2.00 |
| e) Schedule of Wells, 1965 | 3.00 |
| f) Schedule of Wells, 1966 | 3.00 |
| g) Schedule of Wells, 1967 | 2.50 |
| h) Economics of Oil and Gas Development in Northern Canada | 2.50 |
| i) Statistical Report | 2.50 |

### 2–5.1.2 Legislation – Acts and Regulations

The following may be obtained from the Chief, Oil and Mineral Division, and the Oil Conservation Engineer, Calgary:

a) Canada Oil and Gas Land Regulations
b) Canada Oil and Gas Drilling and Production Regulations
c) Land Order No. 1 – 1961, as amended
d) Land Order No. 2 – 1961, as amended
e) Territorial Lands Act
f) Public Lands Grants Act
g) Land Order No. 1 – 1962, as amended
h) Consolidation: Canada Oil and Gas Land Regulations as amended, Oil and Gas Land Orders as amended, Territorial Lands Act and Public Lands Grants Act as amended.

### 2–5.1.3 Miscellaneous

a) Monthly Oil and Gas Bulletin
b) List of Geological Reports and Well History Reports released from confidential status.
c) Oil and Gas in the Yukon Territory and Northwest Territories,

### 2–5.1.4 Oil and Gas Permit Maps

The following maps are available from:

Chief, Oil and Mineral Division,
Northern Economic Development Branch,

Department of Indian Affairs and Northern Development
400 Laurier Avenue West,
Ottawa, Ontario.

and

Oil Conservation Engineer,
Department of Indian Affairs and Northern Development,
3303 – 33rd St. N.W.,
Calgary, Alberta.

Permit maps are revised to date of mailing and include indices of permittees:

| | MAINLAND | SCALE | PRICE |
|---|---|---|---|
| No. 1 | Main Sheet | 1 inch = 25 miles | $3.00 |
| 2 | Southeast Sheet (Oil and Gas Leases shown on this sheet) | 1 inch = 12 miles | 2.00 |
| 3 | Northeast Sheet | 1 inch = 12 miles | 2.00 |
| 4 | East Sheet (Hudson's Bay) | 1 inch = 12 miles | 2.00 |
| | **ARCTIC ISLANDS** | | |
| 50 | Main Sheet | 1 inch = 27 miles | 3.00 |

**Lease Plates**

| | | |
|---|---|---|
| Oil and Gas Lease Plats (1 grid area to a plat) | 1 inch = 1 mile | .25 ea. |

**Roads and Trails**

Roads, Winter Trails and Seismic Lines

N.T.S. – 85 SE-SW (1 sheet) Providence-Great Slave
– 85 North – Rae
– 95 North – Wrigley
– 96 South – Norman
– 105 North – Pelly River
– 105 South – Whitehorse-Teslin-Wolfe Lake-Watson Lake
– 106 South – Wernecke Mountains
– 106 North – Arctic Red River
– 107 South – Port Brabant
– 115 North – Fort Selkirk
– 116 South – Klondike
– 116 North – Porcupine River

All on a scale 1 inch 250,000
85 C, D – Kakisa River–Tathlina Lake 1: = 250,000
95 A, B – Fort Liard–Trout Lake 1 inch = 4 miles

Prices: – $0.50 per map – $7.50 per set of 15 maps.

### 2–5.1.5 Brochures

The following brochures, although out of print, are available for reference purposes in the Library of the Department of Indian Affairs and Northern Development and at some other libraries in Canada:

Guide to Northern Non-Renewable Resources
Communication and Transportation Facilities, Queen Elizabeth Group – Arctic Islands
Resource Management Division – Responsibilities and Administration
Oil and Gas Canada Lands – Volume No. 2 and No. 3.

Technical reports are available for reference use at the office of the Oil Conservation Engineer, Calgary, Alberta

"Technical Reports Available for Inspection 1968" (These are geological and geophysical reports on Canada Lands submitted by oil operators)

### 2–5.1.6 Additional Sources

In addition to the Department of Indian Affairs and Northern Development the following sources of information are available:

All cores and samples from wells drilled on Canada Lands are stored at the Institute of Petroleum and Sedimentary Geology, 3303 – 33rd Street, NW, Calgary Alberta.

Specialized and technical literature pertaining to Northern Canada can be examined or purchased at these government agencies:

a. Northern Co-ordination and Research Centre, or, Library, Department of Indian Affairs and Northern Development, 400 Laurier Ave. West, Ottawa, Ontario

b. Department of Energy, Mines & Resources

| | |
|---|---|
| i) Geological Survey of Canada | Ottawa Ont.<br>Vancouver, B.C. |
| Institute of Petroleum and Sedimentary Geology | Calgary, Alta. |
| ii) Dominion Observatories Branch | Ottawa, Ontario |
| iii) Marine Sciences Branch | Ottawa, Ontario |
| iv) Bedford Oceanographic Institute | Dartmouth, N.S. |
| v) Surveys and Mapping Branch | Ottawa, Ontario |

c. Defence Research Board – Ottawa, Ont.
Scientific Information Service

d. Department of Transport

| | |
|---|---|
| i) Marine Works Branch | Ottawa, Ont. |
| ii) Marine Operations Branch | Ottawa, Ont. |
| iii) Telecommunications and | Edmonton, Alta. |
| Electronics Branch | Ottawa, Ont. |
| iv) Civil Aviation Branch | Winnipeg, Man. |
| v) Meterological Branch | Toronto, Ont. |

e. Arctic Institute of North America – Montreal, P.Q.

f. National Research Council – Ottawa, Ont.

# north of 60

## mines and minerals

northern economic
development branch
department of indian affairs
and northern development
government of canada

# INDEX

## MINES AND MINERALS NORTH OF 60



**Maps**



**Figures**



**Tables**

# MINES AND MINERALS NORTH OF 60

## 3–1.1 – GENERAL

The mineral resources of Canada North of 60 are immense but they have barely been touched. The Federal Government is encouraging private enterprise to move into the Yukon and the Northwest Territories to develop the vast mineral deposits.

The known deposits are tremendous. The iron ore reserves are in the billions of tons. Lead-zinc reserves are already well over 100,000,000 tons. Copper and asbestos reserves are in the millions of tons.

The potential mineral wealth awaiting development is equally impressive. Within the Northwest Territories there are 710,000 square miles of Precambrian rock and 100,000 square miles of Paleozoic rock that are favorable for minerals (See Map 3–1)

The value of mineral production in the Yukon and the Northwest Territories has increased from over $33,897,819 in 1964 to nearly $150,000,000 in 1968. (See Fig. 3–1 and Table 3–1)

In the past four years an estimated $300,000,000 have been spent or are committed to be spent to bring mines into production. Of this, the Federal Government has agreed to pay approximately $140,000,000 in rail and road development and assistance programs.

Four major staking rushes have taken place since 1964. The first resulted from the discovery of the major lead-zinc deposits in the Pine Point area south of Great Slave Lake.

In 1966 the presence of extensive lead-zinc mineralisation was confirmed in the Ross River area, 200 miles northeast of Whitehorse, YT, and another staking rush began. A major open-pit lead-zinc mine will commence production in 1969.

History completed a full circle in 1966 when mineral hunters converged on the Coppermine area of the Northwest Territories and in the ensuing months filed a total of 40,000 claims, the largest staking rush in Canada's history.

This area, on the shores of the Arctic Ocean, first attracted attention nearly 200 years ago when in 1776 the Hudson's Bay Company sent Samuel Hearne to the region to search for reported native copper occurences.

The newest staking rush occurred in the Artillery Lake region, east of Great Slave Lake where nickel showings have attracted hordes of prospectors.

The number of claims staked in the Yukon and the Northwest Territories increased nine-fold, from 5,800 in 1963 to 52,000 in 1968, and current exploration expenditures North of 60 are in excess of $12,000,000 annually. (See Fig. 3–2

## 3–2.1 – GOVERNMENT ASSISTANCE AND SERVICES

The administration of mineral exploration and development North of 60, and the implementation of government legislation affecting them is the responsibility of the Oil and Minerals Division, Northern Economic Development Branch of the Department of Indian Affairs and Northern Development.

The Federal Government offers a number of incentive programs designed to assist interested individuals and companies in the exploration and development of mineral resources North of 60.* These include:

- Northern Mineral Exploration Program
- Northern Roads Program
- Northern Resources Airports Program
- Prospectors' Assistance Program

*see Incentive Programs

### 3–2.1.1 – Development Analysis Section

The Development Analysis Section of the Northern Economic Development Branch carries out financial and engineering evaluations of resource developments where Federal assistance has been requested.

For example, the Section conducted a study to determine the feasibility of processing concentrates from the Pine Point Mines, NWT.

The Section undertook on behalf of the Anvil Mining Corporation Ltd., a study concerning the construction of roads, bridges, power, communications and townsite facilities at the mine site in the Yukon.

### 3–2.1.2 – Mining Section

a) Mining Lands Unit

For administration purposes the Yukon and the Northwest Territories are divided into seven mining districts (See Map 3–2). A Mining Recorder is in charge of each of the districts. The districts and the location of the Mining Recorders' offices are as follows:

| | District | Office |
|---|---|---|
| Yukon Territory | Mayo | Mayo, YT |
| | Dawson | Dawson, YT |
| | Watson Lake | Watson Lake, YT |
| | Whitehorse | Whitehorse, YT |
| Northwest Territories | Mackenzie | Yellowknife, NWT |
| | Nahanni | Watson Lake, YT |
| | Arctic and Hudson Bay | Ottawa, Ontario |

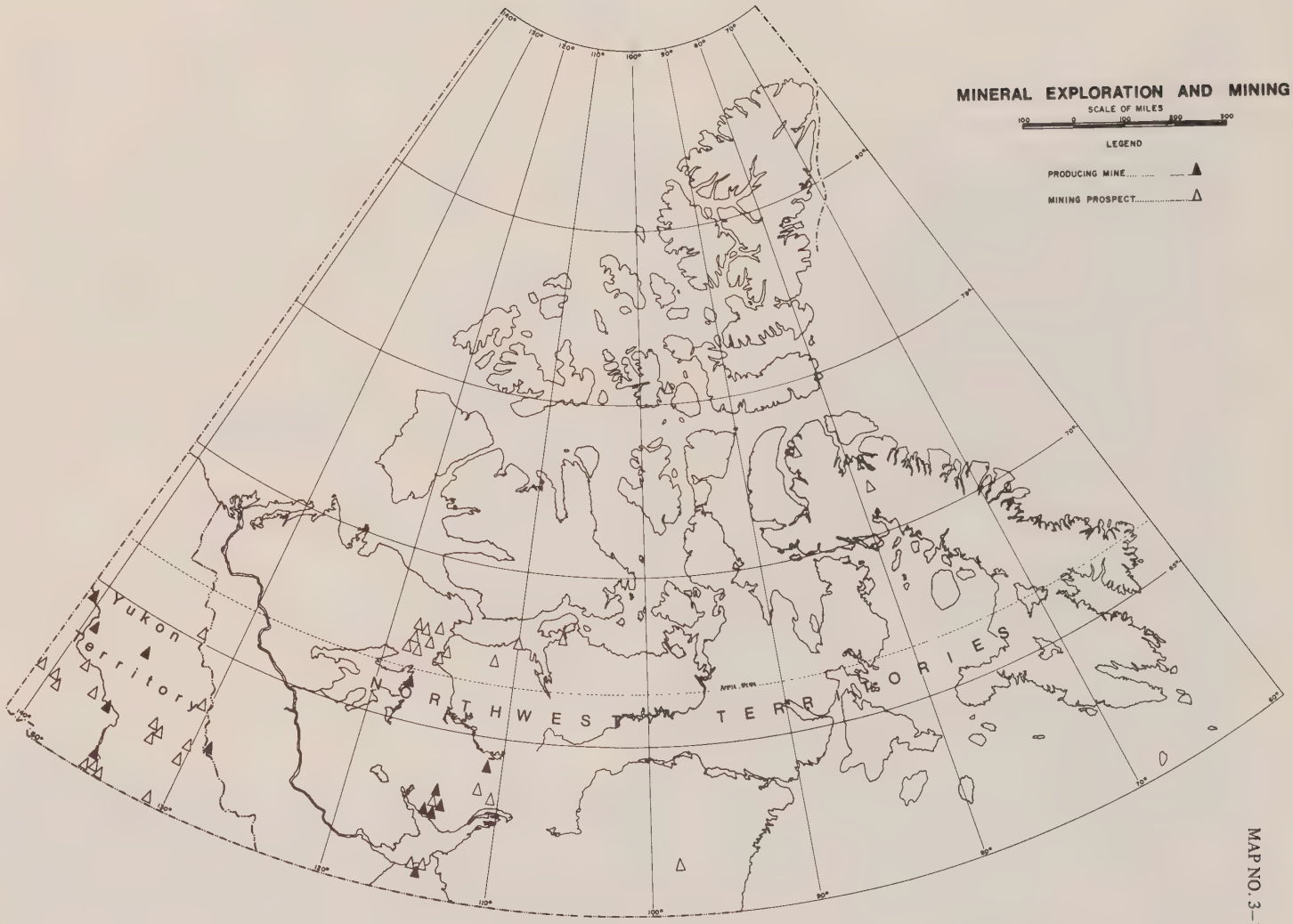
## NORTHWEST TERRITORIES

## MINERAL PRODUCTION CHART – 1959 TO 1968

| Mineral | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 | 1967 | 1968(a) | cumulative Totals(b) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Gold ..... $ | 13,626,802 | 14,194,631 | 14,449,028 | 14,974,924 | 14,609,250 | 15,586,182 | 17,071,580 | 15,990,133 | 14,356,476 | 13,085,822 | 266,572,576 |
| ounces | 405,922 | 418,104 | 407,474 | 400,292 | 387,000 | 412,879 | 452,479 | 424,029 | 380,304 | 347,012 | |
| Silver ..... $ | 61,937 | 70,659 | 73,419 | 84,814 | 107,216 | 91,312 | 1,490,754 | 2,325,407 | 3,429,755 | 8,938,132 | 18,126,520 |
| ounces | 70,560 | 79,473 | 77,890 | 72,802 | 77,468 | 65,223 | 1,064,824 | 1,662,192 | 1,980,228 | 3,855,967 | |
| Copper ..... $ | 292,157 | 315,016 | 270,440 | 194,928 | 10,281 | ..... | 354,342 | 672,065 | 538,077 | 946,108 | 3,936,541 |
| pounds | 986,682 | 1,040,000 | 926,480 | 628,801 | 32,638 | ..... | 942,400 | 1,496,805 | 1,131,126 | 2,097,800 | |
| Nickel ..... $ | 2,689,239 | 2,669,645 | 2,604,789 | 1,503,837 | ..... | ..... | ..... | ..... | ..... | ..... | 12,850,205 |
| pounds | 3,841,770 | 3,813,778 | 3,409,410 | 1,801,002 | ..... | ..... | ..... | ..... | ..... | ..... | |
| Lead ..... $ | ..... | ..... | ..... | ..... | ..... | 823,279 | 25,677,695 | 31,472,562 | 35,665,535 | 35,152,000 | 128,791,071 |
| pounds | ..... | ..... | ..... | ..... | ..... | 6,125,588 | 165,662,547 | 210,659,720 | 254,753,820 | 260,000,000 | |
| Zinc ..... $ | ..... | ..... | ..... | ..... | ..... | 1,111,016 | 28,596,474 | 57,128,344 | 60,852,900 | 60,630,000 | 208,318,734 |
| pounds | ..... | ..... | ..... | ..... | ..... | 7,840,620 | 189,380,626 | 378,333,400 | 419,964,800 | 430,000,000 | |
| Pitchblende(d). $ | 8,155,729 | 9,231,698 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 79,477,897 |
| pounds | 919,333 | 1,077,211 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | |
| Cadmium ..... $ | ..... | ..... | ..... | ..... | ..... | ..... | 516,635 | 2,769,372 | 2,551,920 | 2,565,000 | 8,402,927 |
| pounds | ..... | ..... | ..... | ..... | ..... | ..... | 185,840 | 1,073,400 | 911,400 | 900,000 | |
| TOTAL ..... $ | 24,825,864 | 26,481,649 | 17,397,676 | 16,758,503 | 14,726,747 | 17,611,789 | 76,707,480 | 110,357,883 | 117,394,663 | 121,317,062 | 726,476,471 |
| **YUKON TERRITORY** | | | | | | | | | | | |
| Gold ..... $ | 2,247,847 | 2,652,004 | 2,371,494 | 2,050,255 | 2,084,215 | 2,183,611 | 1,698,975 | 1,639,103 | 675,725 | 941,128 | 266,029,877(c) |
| ounces | 66,960 | 78,115 | 66,878 | 54,805 | 55,211 | 57,844 | 45,031 | 43,466 | 17,900 | 24,957 | |
| Silver ..... $ | 6,192,556 | 6,416,956 | 6,538,897 | 7,551,814 | 8,450,755 | 7,894,196 | 6,462,393 | 5,868,217 | 6,701,756 | 4,778,635 | 133,027,015 |
| ounces | 7,054,632 | 7,217,361 | 6,937,086 | 6,482,244 | 6,106,037 | 5,638,712 | 4,615,995 | 4,194,580 | 3,869,374 | 2,061,534 | |
| Lead ..... $ | 2,290,960 | 2,166,638 | 1,712,198 | 1,615,980 | 1,867,647 | 2,744,235 | 2,766,953 | 2,386,684 | 2,141,959 | 951,117 | 56,277,307 |
| pounds | 21,592,456 | 20,286,871 | 16,769,815 | 16,290,125 | 16,978,607 | 20,418,415 | 17,851,309 | 15,975,125 | 15,299,709 | 7,034,890 | |
| Copper ..... $ | ..... | ..... | 257,098 | 132,990 | ..... | ..... | ..... | ..... | 3,409,779 | 5,755,550 | 12,267,112 |
| pounds | ..... | ..... | 880,773 | 429,000 | ..... | ..... | ..... | ..... | 7,167,919 | 11,965,800 | |
| Coal ..... $ | 58,200 | 97,156 | 114,221 | 115,198 | 123,675 | 98,150 | 85,626 | 46,390 | 15,791 | ..... | 2,567,132 |
| tons | 3,879 | 6,470 | 7,703 | 7,649 | 8,231 | 7,229 | 8,801 | 5,670 | 1,912 | ..... | |
| Zinc ..... $ | 1,621,375 | 1,789,287 | 1,528,100 | 1,438,554 | 1,514,520 | 1,855,512 | 2,000,396 | 1,729,027 | 1,373,151 | 685,260 | 34,422,678 |
| pounds | 13,246,532 | 13,402,899 | 12,137,418 | 11,888,876 | 11,850,706 | 13,094,653 | 13,247,653 | 11,450,510 | 9,476,545 | 4,860,000 | |
| Cadmium ..... $ | 181,440 | 206,604 | 228,296 | 231,328 | 326,124 | 428,399 | 386,192 | 306,336 | 265,997 | 144,638 | 5,596,533 |
| pounds | 141,750 | 145,496 | 142,685 | 134,493 | 135,885 | 132,222 | 138,918 | 118,735 | 94,999 | 50,750 | |
| Asbestos ..... $ | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 406,371 | 10,240,000 | 10,646,371 |
| tons | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 2,260 | 64,000 | |
| TOTAL ..... $ | 12,592,378 | 13,328,645 | 12,750,304 | 13,136,119 | 14,366,936 | 15,204,103 | 13,400,535 | 11,975,757 | 14,990,529 | 23,496,328 | 520,834,025 |

(a) Preliminary Figures (b) Cumulative Totals – 1932 to December 31,1968 (Figures for tungsten not available) (c) Cumulative Totals – 1886 to December 31,1968 (d) Figures for years 1932, 1943, to 1953 not abailable.

TABLE 3–1


MINERAL EXPLORATION AND MINING
SCALE OF MILES
LEGEND
PRODUCING MINE
MINING PROSPECT
Yukon Territory
NORTHWEST TERRITORIES

MAP NO. 3–1

MAP NO. 3–2

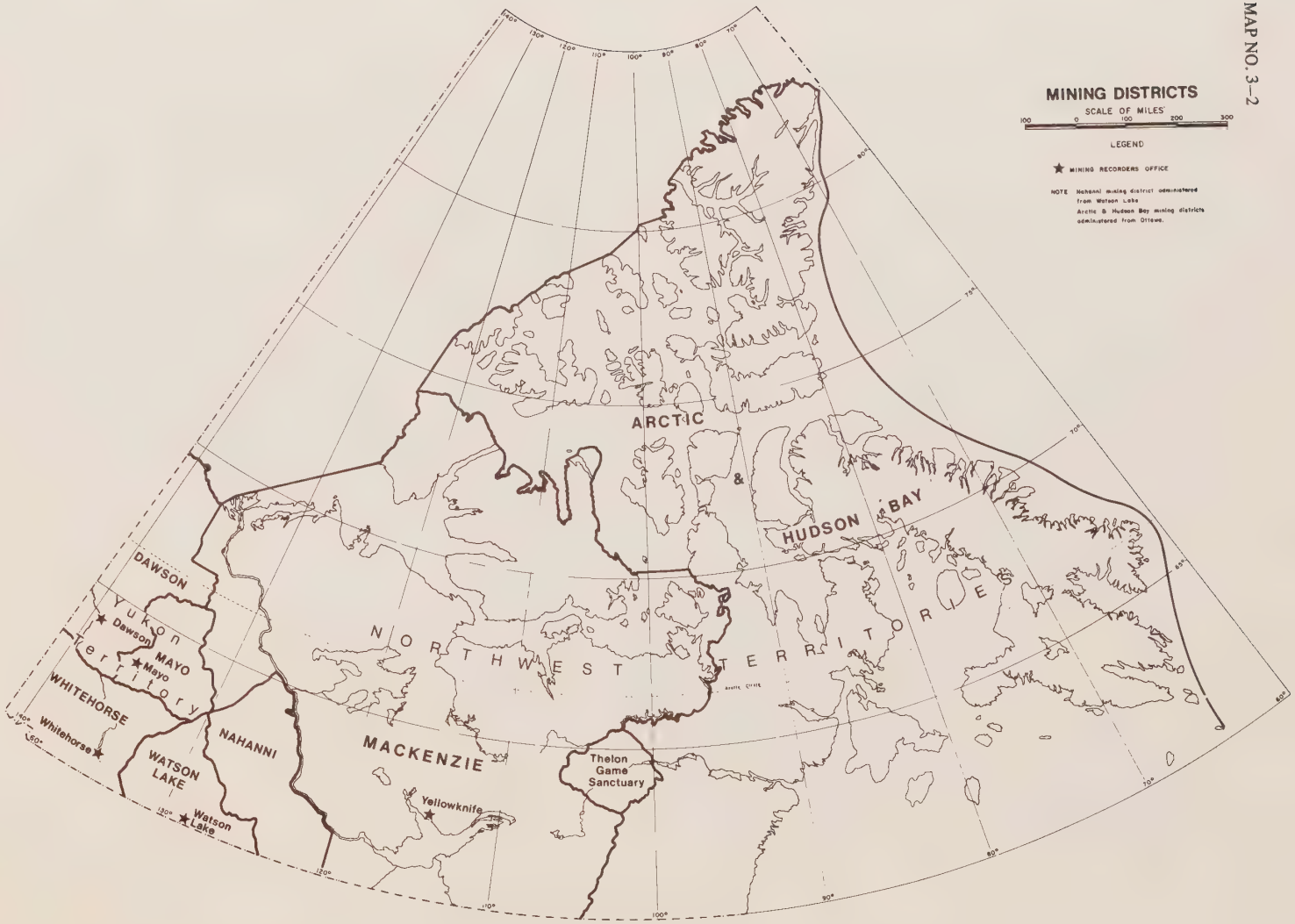

MINING DISTRICTS
SCALE OF MILES
100 0 100 200 300
LEGEND
MINING RECORDERS OFFICE
NOTE Nahanni mining district administered from Watson Lake
Arctic & Hudson Bay mining districts administered from Ottawa.
ARCTIC
&
HUDSON BAY
NORTHWEST TERRITORIES
DAWSON
Yukon Territory
Dawson
MAYO
Mayo
WHITEHORSE
Whitehorse
WATSON LAKE
Watson Lake
NAHANNI
MACKENZIE
Yellowknife
Thelon Game Sanctuary

Fig. 3–1

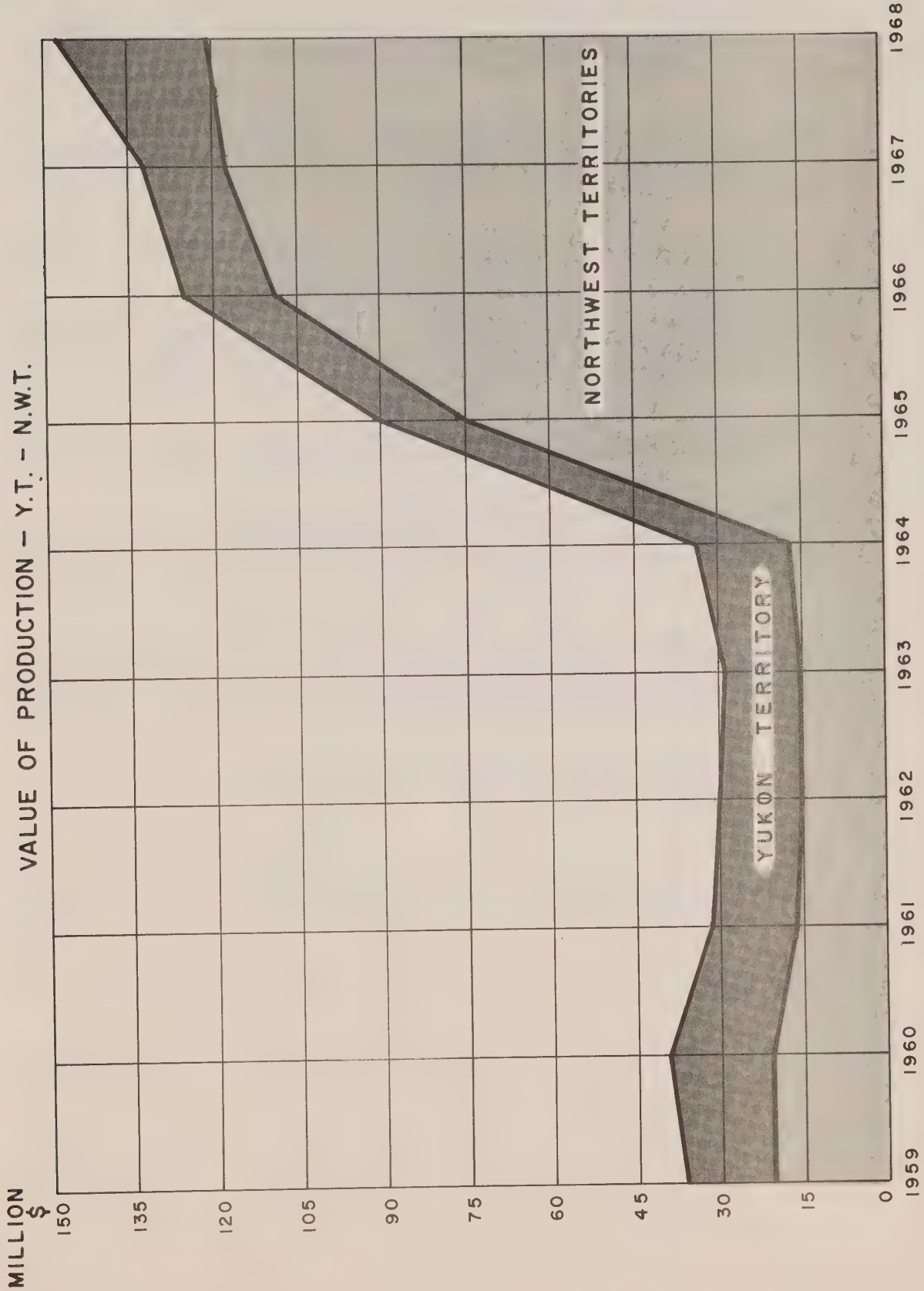
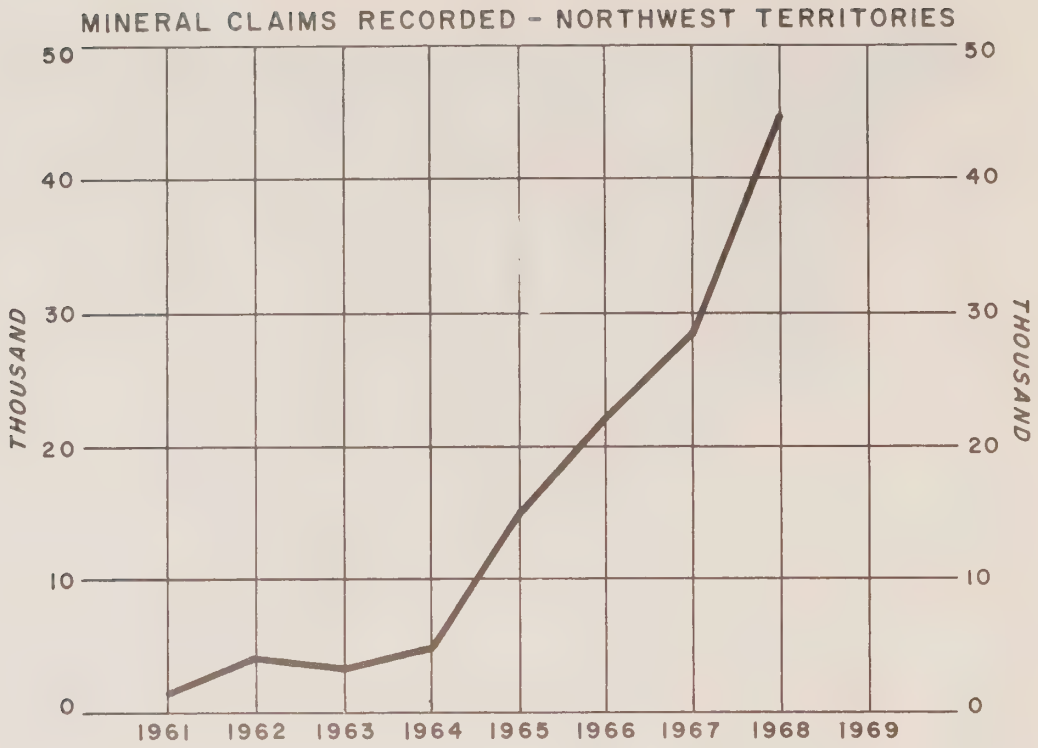
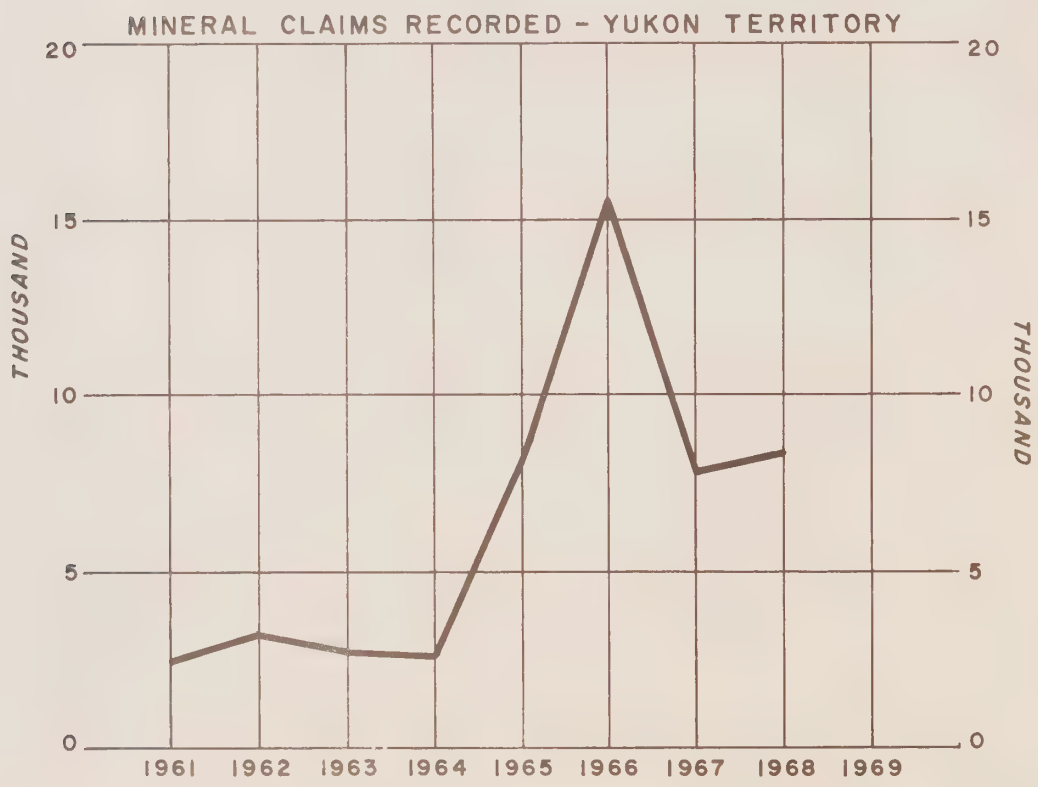

VALUE OF PRODUCTION – Y.T. – N.W.T.
MILLION $
150
135
120
105
90
75
60
45
30
15
0
1959
1960
1961
1962
1963
1964
1965
1966
1967
1968
NORTHWEST TERRITORIES
YUKON TERRITORY

Fig. 3–2


MINERAL CLAIMS RECORDED - NORTHWEST TERRITORIES
THOUSAND
50
40
30
20
10
0
1961
1962
1963
1964
1965
1966
1967
1968
1969


MINERAL CLAIMS RECORDED - YUKON TERRITORY
THOUSAND
20
15
10
5
0
1961
1962
1963
1964
1965
1966
1967
1968
1969

### 3–3.1.2 – Yukon Quartz Mining Act

The provisions of this Act govern Crown-owned minerals in the Yukon Territory. They are similar to those of the Canada Mining Regulations, except that a prospector's license is not required, the two-post staking method is employed, claim boundaries may run in any direction and a lease is not mandatory after ten years.

The Mining Recorder in each Mining District in the Yukon maintains files and books of record and a current claim map system. Northern Economic Development Branch headquarters in Ottawa disseminates information, and prepares interpretations, directives and instructions when necessary.

### 3–3.1.3 – Yukon Placer Mining Act

This Act is applicable to placer mining locations in the Yukon Territory. Claims are rectangular in shape and shall not exceed 500 feet in length along the base line of a stream which is marked by two posts on a line parallel to the stream. The side boundaries are lines parallel to the base line and 1,000 feet distant. Work to a value of $200.00 must be completed annually to keep the claim in good standing.

Royalty is collectable on the basis of $1\frac{1}{2}\%$ of the value of gold shipped from the Yukon Territory (value $15.00 per ounce for this purpose).

Files, books of record and a claim map system are maintained by the Mining Recorder in each Mining District. Interpretations, directives and instructions are prepared and forwarded by the Northern Economic Development Branch headquarters in Ottawa when necessary.

### 3–3.1.4 – Territorial Dredging Regulations

These regulations are applicable to both the Yukon and the Northwest Territories. The 15-year lease system is used on a mileage basis on rivers up to a maximum of 10 miles. A minimum of 20,000 cubic yards must be dredged annually subsequent to the third year of lease. A royalty is payable to the Federal Government on production.

The first year's rental amounts to $100.00 per mile, and subsequent years, $10.00 per mile.

### 3–3.1.5 – Territorial Coal Regulations

These regulations are applicable to both the Yukon and the Northwest Territories. Rights may be secured, either by permit for small users, or by lease for major operations.

The location must be as rectangular in shape as possible, and the length must not exceed four times the width.

A royalty of 10¢ per ton of coal produced under lease is payable to the Federal Government.

As a means of stimulating interest exploratory permits may also be secured. These permits have a life span of three years and cover one-quarter of the area of a claim-map.

### 3–3.1.6 – Mine Safety Ordinances and Rules

These Ordinances and Rules apply to both the Yukon and the Northwest Territories. Safety inspections are made of all mines and oil well drilling rigs to insure compliance with the appropriate Ordinances and Rules. The inspections are carried out by the Inspection Services Unit of the Department.

In the Yukon Territory inspectors are also responsible for inspection of industrial installations and operations.

### 3–3.1.7 – Yukon Blasting Ordinance

Under these regulations underground blasting operations are inspected and the storage and handling of explosives are kept under scrutiny. Candidates for blasting permits are interviewed and examined. Officers of the Inspection Services Unit of the Department carry out the inspections.

### 3–3.1.8 – Explosives Use Ordinance, Northwest Territories

This Ordinance governs the use and storage of explosives on all service projects. Candidates for blasting permits are interviewed and examined. Officers of the Inspection Services Unit of the Department carry out the inspection.

In addition to his administrative responsibilities in the Mining District each Mining Recorder answers queries and distributes information on prospecting and mining topics.

Overall supervision of Recorders Offices North of 60 is carried out by Supervising Mining Recorders located at Whitehorse, YT, and Ottawa. The principal function of these officers is to ensure that uniformity is maintained in the mechanics of the administration of all the mining acts and regulations.

b) Geological Evaluation Unit

The Geological Evaluation Unit of the Mining Section, Northern Economic Development Branch, provides assistance in the various stages of exploration, development and production of mineral resources by evaluating all the geological, geophysical and geochemical work submitted by individuals and companies as a result of representation work in respect of a claim. This Unit also maintains a library of technical reports submitted as representation work and as work programs under the Northern Mineral Exploration Program which are available for public reading once the confidential period is terminated.

c) Inspection Services Unit

The Inspection Services Unit of the Mining Section is responsible for safety inspections of all operating mines. It is also responsible for claim inspection to ensure adherance to the provisions of existing regulations.

The Unit is responsible for the operation of the Mine Rescue Stations in the Yukon and the Northwest Territories and for the training of mine personnel in the use of mine rescue equipment and first aid.

The Mine Rescue Station at Whitehorse, YT, is equipped with 24 Draeger B-174 four-hour oxygen breathing apparatus and half-hour Scott Air Paks.

The Mine Rescue Station at Yellowknife, NWT, has 18 Draeger four-hour breathing apparatus and 24 McCaa two-hour oxygen breathing machines.

## 3–3.1 – MINING REGULATIONS

The administration of mineral exploration and development legislation is the responsibility of the Mining Section of the Northern Economic Development Branch. The following acts and regulations apply:

*Canada Mining Regulations
*Yukon Quartz Mining Act
*Yukon Placer Mining Act
*Territorial Dredging Regulations
*Territorial Coal Regulations
*Mining Safety Ordinances and Rules
*Yukon Blasting Ordinance
*Explosives Use Ordinance, Northwest Territories

The above-named acts and regulations have three basic objectives:

a) to provide an administrative system under which exploration and development of minerals can take place in an efficient and orderly manner.

b) to establish an atmosphere which will encourage both individuals and companies to work in the Yukon and the Northwest Territories.

c) to ensure that a reasonable share of the returns from mineral production is retained in Canada for the benefit of the people, the Territories and the nation as a whole.

### 3–3.1.2 – Canada Mining Regulations

These regulations govern the disposition of Crown-owned minerals in the Northwest Territories – except for certain islands in Hudson Bay and James Bay.

In order to prospect for minerals, stake out or record a mineral claim,the individual or mining company is required to hold a valid prospector's license, issued by the Mining Recorder for the Mining District concerned, or from the Chief, Oil and Mineral Division, Northern Economic Development Branch, Department of Indian Affairs and Northen Development, Ottawa.

Claims are marked by four posts with boundaries not greater than 1,500 feet. These boundaries must run as near as possible to astral North, South, East and West. The total area of each claim is not to exceed 51.65 acres.

Work to the value of $100.00 must be done annually to hold a claim in good standing, and application for a lease must be made within 30 days after the expiration of the tenth year. The Mining Recorder and his staff in each Mining District is responsible for the proper maintenance of all files and books of record, as well as a claim map system.

Information regarding prospecting and mining is disseminated by all media of communication, by the Northern Development Branch in Ottawa, as well as the Mining Recorders. When necessary, interpretations, directives and instructions are prepared at the Economic Development Branch headquarters.

The granting of prospecting permits is a function of headquarters. This program was adopted to encourage the development of remote areas.

## 3–4.1 – PROFILE OF A MINE NORTH OF 60 – CASSIAR ASBESTOS

The challenge of mining North of 60 has been met by Cassiar Asbestos Corporation. The development of Canada's northern-most open pit mine, at Clinton Creek, 65 miles northwest of Dawson, YT, is regarded as a model for mining in the northern regions today.

The combination of new technology and the cooperation and assistance of the Federal and Territorial Governments has resulted in an efficient and profitable operation. The experience of Cassiar Asbestos has encouraged others to move with confidence above the 60° parallel.

The Cassiar Asbestos plantsite is located eight air miles from the Alaskan border, and 65 road miles northwest of Dawson. The townsite overlooks the 40 Mile River, three miles upstream from the confluence with the Yukon River.

The region is one of water-eroded valleys and dome-shaped hills. The overburden is mainly silt-laden rock fragments. Spruce, birch and poplar grow in the valleys and on the slopes to 3,500 feet.

Precipitation in the region amounts to an average of 10 inches per year. In summer, the temperature reaches the high 80s, in the winter it drops as low as 70 degrees below zero. Snow is on the ground from early November until April or May.

### Ore body

The ore body is located on Porcupine Hill across Clinton Creek valley from the plantsite. Proven reserves are estimated at 25,000,000 tons with 8% asbestos fibre recoverable, ore-to-waste ratio 1 – 2.4, length of fibre 1/16" to 1 1/8". The ore zone is 400 feet wide and has been drilled to 900 feet in depth.

### Development

The original discovery was made in 1957 by an Indian fur trapper, Art Anderson. Adits were driven in 1958 and magnetometer and drilling surveys were completed in 1963. A local contractor constructed an access road in 1965-66.

A 480-foot bridge over the 40 Mile River was constructed between January and April, 1966. Unofficial temperatures to 78 degrees below zero were recorded while the bridge was being constructed.

In the spring of 1966, 28 three-bedroom prefabricated houses, together with kitchen and ablution trailers, were brought to the site from Calgary to establish a temporary camp for plant construction.

### Production

The crushing plant, located downhill from the ore body, is equipped with an ore bin heated by hot air circulation around the body of the bin. Serpentine ore is fed into a primary crusher. A belt with a capacity of 350 tons per hour carries ore up to the discharge where a 60" belt transfers the ore to a tramway feeder.

A 5,281-foot tramline – which includes an unsupported span of 2,200 feet between anchor stations – elevates the ore 500 feet to the plantsite at the rate of 300 tons per hour with 70 buckets spaced 180 feet apart on the line. The line reaches a height of 250 feet above

the ground. Each bucket weighs 1,260 pounds, carriers $1\frac{1}{2}$ tons of ore and runs on a $2\frac{1}{2}$" diameter track cable.

The dryer building is of steel frame construction. The ore is dried, crushed and concentrated by rejection to waste pile of all coarse barren material. The ore is then conveyed by belt to a dry rock storage building which has a capacity of 30,000 tons.

An elevated shuttle belt conveyer distributes the ore coming from various sections of the ore body into separate piles to facilitate blending of mill feed. A model 100, 5 cubic yard Payloader moves the ore as required to the hoppers and feeders of sub-floor conveyors carrying ore to the mill service conveyor.

The mill, of laminated timber frame construction, is 102 feet, or seven storeys high, the tallest building in the Yukon Territory. It is covered by a corrugated asbestos shell, with 3" wall insulation.

The mill was originally designed for production of 60,000 tons of fibre per year, but with minor modifications, production can be increased to 80,000 tons.

Milling is a dry process, consisting of five stages of fiberizing and screening for recovery of desired quality and grades of fibre for packaging. Three 125,000 cfm fans provide suction lift for the fibre released from the rock and for dust removal in cyclone collectors.

The fibre is fed into pressure packers and bagged under 2,000 lb. pressure into 100 lb. capacity jute bags. These bags are conveyed to a palletizing machine and strapped in one-ton units for storage and shipping.

Attached to the mill is a fibre storage shed which can handle 1,400 tons of palletized fibre.

The service building contains a heavy duty equipment garage, warehouse, and mechanical, electrical and carpenter shops. It includes a sub-floor hot water heating system in the garage for thawing vehicles and for the convenience of the mechanics. Overhead cranes are installed in the garage and machine shop.

The second floor includes lockers, showers, etc., for employees.

Water is pumped to the mill a distance of 3,088 feet, being elevated 650 feet from Easter Creek dam through a system of aluminum pipe wrapped with heating cable and placed in an insulated box.

A 350,000 gallon steel tank in a wooden housing stores water for fire protection. The main building is fitted with a sprinkler system.

An oil-fired furnace produces steam in the service building and is distributed to the administration building. Mill equipment normally generates its own heating.

Fuel oil is delivered to the plant by 2,300-gallon capacity belly tanks under fibre haulage trailers on a back haul basis, and stored in a 350,000 gallon steel tank.

Electric power is generated by four 1,400 kilowatt diesel generators. Waste heat boilers produce heat for the townsite, supplemented by two 300 h.p. steam boilers in the power house. Cooling water is drawn from 40 Mile River by turbine pumps.

**Townsite Services**

Water is pumped from the river to a 350,000 gallon storage tank for domestic water and fire protection. Heating comes from power house waste and additional boilers. Fuel oil is stored in a 350,000 gallon steel tank.

Sewers are laid separately in trenches, with the discharge directed into an aerobic treatment plant below the townsite.

Utilidors below ground level carry all steam and water lines. A fire break has been established around the entire townsite area.

Buildings are erected on wooden piles sunk in holes auger-drilled to 21 feet. Frozen material from the excavation in the permafrost is used as backfill around the pile for the bottom 14 feet. Dry sand seven feet in depth is placed on top of the backfill and capped by former material. Seasonal frost in the region penetrates seven feet and the sand allows for ground movement.

Single persons on the mine staff are housed in three two-storey, 40 room bunkhouses, four 10-room aluminum trailers, one 17-room junior and senior men's staff house, and one 11-room ladies' staff house.

Family accommodation includes six furnished trailer units, 31 three-bedroom prefabricated homes, one four-bedroom prefabricated home, and five houses for management.

Company homes are available to married staff personnel. The company assists other employees to acquire their own homes through a liberal mortgage and loan plan.

The townsite also includes a four-room school and activity room, built under government contract at a cost of $272,000, and a prefabricated medical clinic containing three two-bed wards and an x-ray room, costing $60,000.

**Mining**

Waste stripping of argillites and limestone to prepare the open pit was carried out in 1966-67. The ore is mined in 30 foot benches. An estimated 1,500 tons of explosives are used in the pit each year, the largest blast to date producing 100,000 tons of waste.

The current inventory of heavy duty equipment in the operation includes:

1 electric 5 cubic yard shovel
1 electric 9" diameter rotary drill
1 electric 7" rotary drill
4 65-ton Letourneau West. Haulpak trucks
2 35-ton Letourneau West. Haulpak trucks
1 8 cubic yard Hough 400 loader
1 2 cubic yard Northwest 80D shovel
2 D8 Caterpillar tractors
Sundry service equipment.

**Transportation**

The transport division of Cassiar Asbestos operates out of Whitehorse and hauls an average load of 23 tons of fibre over 400 miles of gravel road from the mine. The fibre is containerized and placed aboard White Pass and Yukon Railway cars and transported over narrow guage rail 110 miles to Skagway for trans-shipment by container ship to Vancouver. Shipments from Skagway are made every two weeks.

A limited amount of fibre is also trucked down the Alaska Highway.

During the spring breakup and fall freezeup a 1,400-foot aerial cableway, capable of carrying 12 tons, is used to ferry freight across the Yukon River at Dawson City. During the winter months the river is crossed on an ice bridge and during the summer, the Territorial Government operates a ferry.

In the fall of 1968, Great Northern Airways included Clinton Creek on its regular schedule operating from the company-built 5,000 foot airstrip.

**Personnel**

Cassiar Asbestos employs 203 hourly-rated personnel and 60 salaried personnel at Clinton Creek. Of this, 25, including six persons of Indian extraction, are Dawson residents. Some 28 nationalities by birth are represented on the work force, and 50 per cent are Canadian-born.

The annual payroll is $3,500,000 including fringe benefits.

**Costs**

| | |
|---|---|
| Total capital outlay to end 1968 | $26,000,000 |
| Sample Costs: | |
| Aerial Mapping | $ 45,000 |
| Soil Testing – ore sampling | 25,000 |
| Water Investigation | 25,000 |
| Access road from 60 Mile Road | 575,000 |
| Other roads in mine, plant and townsite areas | 225,000 |
| Construction camp | 110,000 |
| 40 Mile River bridge | 1,200,000 |
| Waste stripping | 775,000 |
| Yukon River skyline | 220,000 |
| Plant and equipment | 1,735,000 |
| Townsite and community services | 3,665,000 |
| Automotive and heavy duty equipment | 2,000,000 |

*Recovered from Government participation in access road, 40 Mile River bridge and Yukon River skyline – $1,081,480

*Value of inventory of operating stores – $1,000,000

*Daily cost per man for room and board – $7.00

*Current range of wage rates – $2.90 – $4.10 per hour

*Average hours per week per man – 50

*Estimated costs for mining, shipping/selling – $50 for each ton of fibre produced.

## 3–5.1 – MINING EXPLORATION COSTS

Costs of exploration North of 60 are higher than those in the settled regions to the south. However, as local services increase, and individual ingenuity and technical advances combine to meet the challenge of the northern regions, these costs are coming down year by year.

Typical exploration costs in the mining industry North of 60 in 1968:

| | |
|---|---|
| a) Line Cutting | |
| Barren Land | $40 – $ 70 per mile |
| Treed Area | $70 – $120 per mile |
| b) Airborne Geophysical Surveys | |
| Electro Magnetic | $15 – $ 50 per mile |
| Magnetometer | $ 4 – $ 15 per mile |
| Combined | $20 – $ 55 per mile |
| c) Ground Geophysical Surveys | |
| Combined E.M. and Mag Survey | $200 per mile |
| Combined Survey and Line Cutting Included | $250 – $300 per mile |
| Induced Polarization Survey | $250 per day or $500 – $1000 per mile |
| Gravity Survey | $250 – $650 per mile |
| d) Geochemical Surveys | |
| Sampling | $1.50 – $3.00 per sample |
| Analysis | $1.30 – $3.00 per sample |
| To conduct a complete survey | $2.80 – $7.00 per sample |
| e) Diamond Drilling Surface and Underground | $ 6 – $20 per foot |
| f) Underground Exploration | |
| Drifting and Raising | $85 – $90 per foot |
| Includes all cost except | |
| Geology and Engineering | |
| g) Average Salaries | |
| Engineer | $900 monthly |
| Geologist | $800 monthly |
| Helper | $500 monthly |
| h) Bulldozer Rentals | |
| D – 4 to D – 9 | $20 per hour to $50 per hour |
| i) Labour | $3.00 per hour |
| Carpenter | $4.25 per hour |
| Heavy Duty Equipment Operator | $4.00 – $5.00 per hour |
| j) Camp Costs | $12 per man per day |

## 3–6.1 – NORTH OF 60 – THE YUKON TERRITORY

The memory of the Klondike Gold Rush of 1896, the most frenzied and spectacular gold rush ever seen, lives on in the Yukon, and in the hearts of adventurers the world over.

Today, the old fever is returning to the Territory as mineral hunters spread deeper into the northern regions looking for the same kind of strike the early prospectors found in the famous Bonanza Creek discovery. By 1966, when placer mining operations in the area finally ceased, the Klondike had produced well in excess of $200,000,000 in gold.

The development of the Yukon mining industry has been sporadic until recent years. After the Klondike, only minor placer deposits were discovered in the Territory. Little attention was given to lode deposits. The first recorded lode discovery in the now famous Mayo area was made by H.W. McWhorter in 1906 – a silver-lead vein outcropping in Galena Creek near the present town of Elsa. Some production commenced in 1912. Further prospecting was carried out, and in 1919 another important discovery was made on Keno Hill.

Mining by Keno Hill Limited began in 1920, followed by Treadwell Yukon Company in 1923. Operations were suspended in 1942 and revived again in 1948 with the formation of United Keno Hill Mines Limited, who have operated several mines in the area during the intervening years. Until recently, United Keno Hill was Canada's largest single producer of silver concentrates.

Activities in the four mining districts of the Yukon Territory:

### 3–6.1.1 – Mayo District

**Producing Mines**

United Keno Hill Mines Ltd.

| | |
|---|---|
| Location | 26 miles northeast Mayo |
| Product | silver, lead, zinc, cadmium concentrates |
| Rate of production | 154 tons daily (1968) |
| Grade | 38.6 ozs, per ton silver |
| | 7.5% lead |
| | 6.5% zinc |
| Reserves | 100,230 tons. |
| Employees | 260 |

**Development and Exploration**

Recent exploration activity has centred around silver, lead, zinc, iron, copper and tungsten.

Among the major work being done in the district, Atlas Explorations Ltd. has been actively exploring its 184 claims covering four silver-lead-zinc prospects in the South McQueston Valley within 29 miles of United Keno Hill's Elsa Mine.

Crest Explorations Ltd. has done extensive diamond drilling, beneficiation and feasibility surveys on its 612 mineral claims located east of the Snake River, 150 miles northeast of Mayo. The claims cover a massive high grade Hematite occurrence.

The Arrow-Inter America Corporation has halted its underground exploration program on a silver-lead property 40 miles northeast of Mayo. A main adit and several short exploration drifts were driven in the summer of 1968.

Hart River Mines Ltd. has carried out an extensive drilling and soil sampling program on claims 80 miles northeast of Dawson. The company plans to spend an additional $500,000 on a new phase of its program. The mineralization consists of irregularly banded pyrrhotite and pyrite carrying mainly chalcophyrite, sphalerite and small amounts of galena.

Copper mineralization in the Mayo area is being actively examined by Cyprus Exploration Corporation Ltd. and Bonnet Plume Mines.

Amax Exploration Inc., a wholly owned subsidiary of American Metal Climax Inc. has carried out a geological mapping and diamond drilling program on a promising tungsten property on the Yukon-NWT border at MacMillan Pass.

Atlas Explorations, Hudson Bay Mining Company and Spartan Exploration have been active in primary exploration in the eastern sections of the Mayo district.

### 3–6.1.2 – Dawson District

**Producing Mines**

Cassiar Asbestos Corporation Ltd.

| | |
|---|---|
| Location | 65 miles northwest Dawson |
| Product | asbestos fibre |
| Rate of production | 2,348 tons daily (1968) |
| Grade | 6–7% of 1/16" – 1 1/8" fibre |
| Reserves | 25,000,000 tons |
| Employees | 263 |

**Development and Exploration**

Gold, silver and lead prospects are being examined in the Dawson district. The most active explorer is Connaught Mines Limited which is working its Mosquito Creek silver-lead property. The property contains a number of massive galena veins, two of which were high graded in a limited way (25 tons) in 1966.

### 3–6.1.3 – Watson Lake District

**Producing Mines**

No mineral production is taking place in the district at the present time.

**Development and Exploration**

Silver, lead and zinc showings are being actively examined. Hudson Bay Mining and Smelting Co. Ltd. is carrying out an extensive diamond drilling program, as well as mapping and geochemical surveys on a lead-zinc prospect near the Yukon-NWT border.

The prospect was found in 1951 and in 1953 the exploration program was completed, with 10,470,000 tons of mineralization being indicated.

Atlas Explorations Ltd. holds 1,000 mineral claims covering three areas of the Watson Lake district. The Mt. Hundere prospects, located 35 miles north of Watson Lake, contain high-grade lead-zinc mineralization. The work to date indicates a limited tonnage.

Atlas' Fyre Lake prospects, 86 miles southeast of Ross River, contain copper mineralization. The Sheldon prospects, covering seven claim groups in the Ross River area, have revealed lead-zinc mineralization, with varying amounts of silver-gold and copper.

In 1968 a joint venture agreement was made by Atlas with Mitsui Mining and Smelting Co. of Japan on the Sheldon project.

Spartan Explorations Ltd. holds nearly 1,000 mineral claims in the district. In 1967 the company carried out a major exploration and prospecting program in an area east of McPherson Lake and staked 780 claims. The following year it carried out a major prospecting exploration program in the district.

Silver lead prospects are under active study by Stump Mines Ltd. on property at the headwater of the Ketza River, 120 miles northeast of Whitehorse. Adit development and underground diamong drilling have uncovered highgrade silver prospects.

Tintina Silver Mines has re-activated its exploration program on 108 claims covering a silver-lead prospect 100 miles northwest of Watson Lake. Results of original work done in 1962 were considered disappointing and the program was halted.

Mineralization indicating up to 10% zinc has been found by Norquest Joint Venture on a lead-zinc showing near mile 59 of the Watson Lake – Canada Tungsten road.

The Venture is formed by the Anaconda Company (Canada) Limited, Asbestos Corporation (Explorations) Limited, Bralorne Pioneer Mines Limited, Granby Mining Company Limited, New Jersey Zinc Company (Canada) Limited, and Utah Construction and Mining Company.

### 3–6.1.4 – Whitehorse District

**Producing Mines**

(a) New Imperial Mines

| | |
|---|---|
| Location | 7 miles from Whitehorse |
| Product | copper concentrates |
| Rate of production | 2,000 tons daily (1968) |
| Grade | 1.15% copper |
| Reserves | 4,590,000 tons open pit |
| | 5,000,000 tons underground, graded at 2% |
| Employees | 161 |

(b) Arctic Gold and Silver Mines

| | |
|---|---|
| Location | 8 miles south of Carcross |
| Product | gold, silver, lead, zinc concentrates |
| Rate of production | 100 tons daily (1968) |
| Grade | 0.52 ozs per ton gold |
| | 14.4 ozs per ton silver |
| Reserves | 37,870 tons |
| Employees | 70 |

(c) Mount Nansen Mines Limited

| | |
|---|---|
| Location | 45 miles west of Carmacks |
| Product | gold, silver concentrates |
| Rate of production | 250 tons daily (1968) |
| Grade | 0.39 – 0.50 ozs per ton gold |
| | 16– 22.3 ozs per ton silver |
| Reserves | 330,000 tons |
| Employees | 60 |

**Development and Exploration**

Major development programs are currently under way on two properties in the Whitehorse district.

Anvil Mining Corporation Limited is developing one of the largest lead-zinc mines in Canada with production scheduled to start in late 1969. Located 130 air miles northeast of Whitehorse, it is regarded as one of the most significant developments for the Yukon economy since the Gold Rush.

A major loading facility for ocean-going ships is being constructed at Skagway, Alaska, and improvements are being made to the line and bulkhandling systems of the White Pass and Yukon railway linking Whitehorse and Skagway, a Pacific Ocean port.

The Anvil mine is expected to produce enough ore to supply a 5,500 ton-per-day mill. Preparation of the open pit for production and the construction of the mill building, access road, townsite, dwellings, bridges and shops began in 1968.

Ore reserves of the Anvil mine are estimated at 63,000,000 tons of 9% combined lead-zinc with little more than 1 ounce of silver per ton.

Contracts for the sale of concentrates with Mitsui Mining and Smelting Company Ltd. and Toho Zinc Company Ltd., both of Japan, call for the purchase of the total mine production for the first eight years.

Venus Mines Limited has plans for a possible mill and development work is continuing on its gold-silver prospect in the Windy Arm area of Tagish Lake, southeast of Whitehorse. Extensive exploration has outlined reserves estimated at 138,400 tons carrying 0.39 ounces gold and 11.6 ounces silver.

Exploration of copper prospects has constituted a large portion of the activity in the Whitehorse district, with underground drilling on copper-nickel prospects taking place on property held by Discovery Mines Ltd., near Mile 1167 of the Alaska Highway. Diamond drilling on a copper property south of the Pelly River, 48 miles downstream from Anvil, was carried out on behalf of McIntyre Porcupine Mines Ltd.

Lead-zinc exploration in the Vangorda Creek – Anvil Project areas continues to be important and some work has also been done on manganese showings in the district. Exploratory work by Kerr Addison Mines Limited in the Vangorda Creek area between 1963 and 1968 uncovered a mineralized body containing approximately 5,000,000 tons grading 1.5 ounces silver and 9.5% combined lead-zinc, plus minimum copper and gold values.

A primary exploration program in the northeast area of the district was carried out in 1968 by Atlas Exploration Limited. This program was supported by helicopter and fixed wing aircraft.

Hudson Bay Mining and Smelting carried out a surface exploration program on property at Quill Creek, seven miles west of Mile 1111 of the Alaska Highway. The nickel-copper showing was found in 1952 and an extensive surface and underground exploration program was carried out. The program indicated reserves of 737,600 tons averaging 2.04% nickel, 1.42% copper, 0.005 ozs. gold, 0.038 ozs. platinum, 0.027 ozs. palladium, 0.073% cobalt.

## 3–7.1 – NORTH OF 60 – NORTHWEST TERRITORIES

The mineral potential of the Northwest Territories was first discovered some 200 years ago, when the Hudson's Bay Company sent Samuel Hearne to the Coppermine area, on the Arctic coast, to search for reported native copper occurrences.

Hearne was not very impressed by what he saw on the rockstrewn plain of the Central Arctic, but since his trip in 1776 the area has continued to intrigue mineral hunters. In 1911–12 the first detailed examination of the Coppermine area was carried out. Further interest was shown in 1930, 1944, 1952 and 1957. Finally, in 1966 the biggest staking rush in Canada's history got under way in the Coppermine region and today it is under intensive examination.

The first mineral production in the Northwest Territories took place on the shores of Great Bear Lake in 1932 with the famous Eldorado radium mine. This property assumed great importance during World War II when uranium was required for the manufacture of the atomic bomb.

Gold was discovered in the Yellowknife area in 1934 and in 1938 the Con Mine came into production. It was followed by four others. Most of these mines closed with the outbreak of World War II. However, activity was renewed and in 1948 the Con Mine was re-opened and Giant Yellowknife, the largest gold producer in the Northwest Territories came into production the same year, followed by Discovery in 1950.

Tundra – the first mine in the Barren Lands – commenced producing gold early in 1964. This operation, which subsequently closed down in 1967 proved the possibilities of operating in remote areas subject to severe climatic conditions.

Since 1964 the mineral economy of the Northwest Territories has moved forward rapidly. When the Pine Point lead-zinc mines opened in 1964 the value of mineral production in the Northwest Territories jumped from $18.7 million to $77 million, and is currently $117 million.

Echo Bay Mines revived mining in the Great Bear Lake area when it developed a rich silver vein close to the old Eldorado mine. Close to the border with the Yukon Territory the first tungsten mine North of 60 commenced production in 1962. It has gone on to become the major producer of tungsten in North America.

With the completion of the Great Slave Lake Railway to Pine Point and Hay River, considerable exploration activity was generated in the Pine Point area.

Pyramid Mining Company, in October, 1965, obtained a good ore intersection in its diamond drilling program, and when news of this was disclosed a staking rush followed. By mid-1966 some 30,000 mineral claims were recorded in this area.

Although many anomalies were drilled, only a few companies were successfull in outlining ore.

During the summer and fall of 1966 the activity shifted from the lead-zinc deposits in the Pine Point area to copper in the Coppermine and surrounding areas.

Activities in the three mining districts of the Northwest Territories.

### 3–7.1.1 – Mackenzie District

Most of the mineral production of the Northwest Territories comes from the Mackenzie district. The value of mineral production from 1934 to 1967 totalled $587,749,930. There are seven producing mines in the district, including five gold, one silver-copper, and one lead-zinc mine. Six are underground operations and one is open pit.

**Producting Mines**

(a) Con-Rycon Vol.

| | |
|---|---|
| Location | 1.5 miles south of Yellowknife |
| Product | gold |
| Rate of Production | 525 tons daily (1968) |
| Grade | 0.65 ozs/ton |
| Reserves | not available |
| Employees | 225 |

(b) Giant Yellowknife Mines Ltd.

| | |
|---|---|
| Location | 1.5 miles north of Yellowknife |
| Product | gold |
| Rate of Production | 800 tons daily (1968) |
| Grade | 0.71 ozs/ton |
| Reserves | 1,628,500 tons |
| Employees | 350 |

(c) Supercrest Mines Ltd.

| | |
|---|---|
| Location | 1.5 miles north of Yellowknife |
| Product | gold |
| Rate of Production | 100 tons daily |
| Grade | 0.70 ozs/ton |
| Reserves | 260,000 tons |
| Employees | operated by Giant Yellowknife Mines Ltd. |

(d) Lolor Mines Ltd.

| | |
|---|---|
| Location | 1.5 miles north of Yellowknife |
| Product | gold |
| Rate of Production | 100 tons daily |
| Grade | 0.67 ozs/ton |
| Reserves | 324,000 tons |
| Employees | Operated by Giant Yellowknife Mines Ltd. |

(e) Discovery Mines Ltd.

| | |
|---|---|
| Location | 50 miles north of Yellowknife |
| Product | gold |
| Rate of Production | 225 tons daily |
| Grade | 0.48 ozs/ton |
| Reserves | nil (production ending in 1969) |
| Employees | 80 |

(f) Pine Point Mines Ltd.

| | |
|---|---|
| Location | south shore Great Slave Lake |
| Product | lead, zinc concentrates |
| Rate of Production | 8,000 tons daily |
| Grade | 9–11% combined lead-zinc |
| Reserves | reported at 40,500,000 tons |
| Employees | 328 |

High grade ore shipped to Consolidated Mining and Smelting Company smelters at Trail B.C. Lead-zinc concentrates shipped to Japan, the United States, and India.

(g) Echo Bay Mines Ltd.

| | |
|---|---|
| Location | Great Bear Lake |
| Product | silver, copper concentrates |
| Rate of Production | 100 tons daily |
| Grade | 76 ozs. per ton silver, 20% copper |
| Reserves | not available |
| Employees | 87 |

Concentrates are shipped by barge, winter road and aircraft from the property to rail head at Hay River for trans-shipment to smelters.

**Development and Exploration**

The Coppermine area of the Mackenzie district has become the scene of the most active exploration work in mining history, beginning in 1966.

P.C.E. Explorations and Coppermine River Mines were the first of some 60 companies that moved into the area to explore the historic region. These two firms succeeded in outlining in excess of 4,000,000 tons of ore averaging 3.00% copper.

Most of the companies in the area undertook intensive programs, consisting of geological, geophysical surveying and diamond drilling. Copper mineralization in the form of bornite and chalcocite is widespread.

The search for copper subsequently spread to the neighboring islands in the Arctic Archipelago. Prospecting permits were issued on Victoria Island and, in addition, a number of claims were staked in the area. Bornite and chalcocite mineralization was reported.

In other exploration activity in the district, Silver Bear Mines has developed silver prospects on a property on Rainy Lake, 35 miles south of Echo Bay Mines. Ore was stockpiled on a silver-copper-bismuth showing on neighboring property.

A silver-copper-cobalt-lead prospect on the Camsell River is under study by Caesar Silver Mines Limited.

### 3–7.1.2 Nahanni District

**Producing Mines**

Canada Tungsten Mining Corporation

| | |
|---|---|
| Location | 125 miles north of Watson Lake |
| Product | tungsten-copper concentrates |
| Rate of Production | 350 tons daily (1968) |
| Grade | 1.71% $WO_3$, 0.45% copper |
| Reserves | 934,000 tons |
| Employees | 70 |

**Development and Exploration**

Copper deposits in the Redstone River Valley area have been under examination since the early 1969s, with Redstone Mines Limited, which holds 591 claims on the site, undertaking 22,000 feet of diamond drilling and some geological survey work.

Underground exploratory work on a silver-lead showing on Prairie Creek, about 125 miles due east of the Canada Tungsten mine, was commenced by Cadillac Exploration Limited in 1968.

### 3–7.1.3 Arctic and Hudson Bay District

**Producing Mines**

There is no producing mine in the Arctic and Hudson Bay district at the present time. North Rankin Nickel Mines operated a copper-nickel mine on the west coast of Hudson Bay from May 1957 to September 1962 until all known ore was exhausted. North Rankin produced 21.3 million pounds of nickel and 5.8 million pounds of copper.

**Development and Exploration**

One of the world's largest high grade iron ore discoveries was made at Mary River, in the northwestern area of Baffin Island. Exploratory work in 1963–64 confirmed the body to contain approximately 130,000,000 tons of iron ore grading 68.2% iron.

Baffinland Iron Mines Limited was formed by British Ungava Explorations Limited to take over development of this deposit and feasibility studies commenced in 1965. These studies on marketing, shipping and other aspects are continuing.

A large block of claims on a lead-zinc prospect at Strathcona Sound on the northern tip of Baffin Island is being investigated by Texas Gulf Suphur. Some 40,000 feet of diamond drilling were completed by the end of 1968 and further exploration and testing was scheduled to be conducted on the property. Surface exploratory work on a lead-zinc prospect on Little Cornwallis Island was launched in a joint venture by Cominco and Bankeno Mines Limited.

# water north of 60

northern economic
development branch
department of indian affairs
and northern development
government of canada

## INDEX

## WATER NORTH OF 60



Revised April, 1971.

# WATER NORTH OF 60

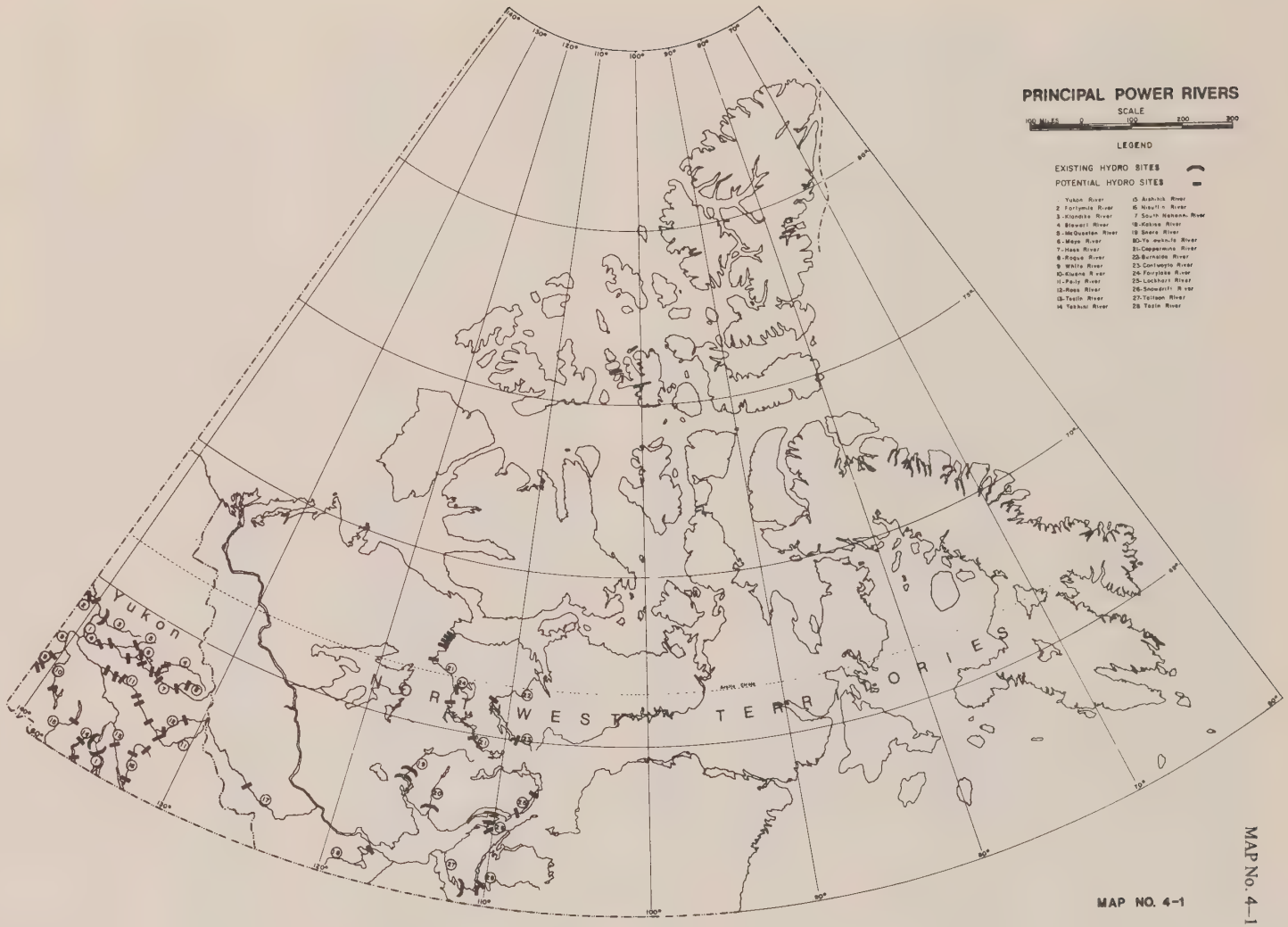
## 4–1.1 – GENERAL

Water is becoming recognized as the most important renewable resource North of 60. The development of the Yukon and Northwest Territories will continue to depend on water for transportation and hydro-electric power generation. In addition, attention is now being focussed on the feasibility of diversions southward and on the need to maintain the current high quality of northern waters in the face of increasing commercial activity in the North.

As the region enters a period of sustained industrial expansion, there will be an increasing demand for water needed in resource processing and other industrial uses, and for use by an expanding population. Also, the obligation of Government to protect the right to water of the indigenous population for fishing and trapping of fur-bearing animals is recognized, as well as the need to conserve water for recreation purposes.

There are two dominant features of the northern water regime that influences the supply of water available for use in the Yukon and Northwest Territories. The first is that much of the flow in the two main drainage basins, the Mackenzie and Yukon systems, originates south of the 60th parallel. The second is that the level of precipitation in the North is generally very low. Although maps reveal countless lakes in the North, their existence depends on low evaporation and the fact that drainage is inhibited by underlying permafrost and the nature of the Canadian Shield.

It has been estimated that up to 50% of Canada's fresh water resources are located north of the 60th parallel. Usable water, however, in the form of continuous flows, likely comprises only half of this amount, with the remainder held in dead storage.


PRINCIPAL POWER RIVERS
SCALE
100 MILES 0 100 200 300
LEGEND
EXISTING HYDRO SITES
POTENTIAL HYDRO SITES
1 Yukon River
2 Fortymile River
3 Klondike River
4 Stewart River
5 McQuesten River
6 Mayo River
7 Hess River
8 Rogue River
9 Wolfe River
10 Kluane River
11 Peel River
12 Ross River
13 Teslin River
14 Tesham River
15 Arctic River
16 Nisutlin River
17 South Nahanni River
18 Kokiri River
19 Snare River
20 Yellowknife River
21 Coppermine River
22 Burnside River
23 Coppermine River
24 Fortymile River
25 Lockhart River
26 Snowdrift River
27 Taltson River
28 Tazin River
Yukon
NORTHWEST TERRITORIES
MAP NO. 4-1

MAP No. 4–1

## 4–2.1 – FEDERAL GOVERNMENT SERVICES

### 4–2.1.1 – Department of Indian Affairs & Northern Development

The Water and Land Use Management Section of the Northern Economic Development Branch is responsible for the management of water use, including pollution control, in the Yukon and Northwest Territories.

The Section is responsible for the orderly development and utilization of water in the expanding economies of the Yukon and Northwest Territories, which involves:

a) allocation of rights to the use of water in the best interests of the region and of the nation as a whole, through a system of water rights licencing;

b) comprehensive planning of the development of northern water bodies, including joint management with provincial governments of those water bodies that cross the 60th parallel, and reservation from use of lakes, or streams, and adjacent lands, if necessary, in the interests of long-term planning;

c) maintenance of the high quality of northern waters; and

d) maintenance of acceptable engineering standards and practices for the design and construction of all works and undertakings for the use, diversion, storage or treatment of northern waters.

*The Northern Inland Waters Act* is the primary instrument of the Section for managing northern waters. It provides for water rights licencing, pollution control and comprehensive planning. Under the Act, all users of water are required to obtain a Water Rights Licence from Territorial Water Boards located in Whitehorse and Yellowknife.

The Act and its Regulations went into effect in early 1971. The Section also administers the Dominion Water Power Act and Regulations, which are applicable to all water powers on federal public lands. The Regulations set out requirements and procedures to be followed by individuals or corporations wishing to investigate and develop Dominion water powers.

### 4–2.1.2 – Other Federal Government Departments

The following departments and agencies have responsibilities for northern waters, of a national nature:

1. *Department of Energy, Mines and Resources* – hydrometric network planning and operation; water quality analysis:

2. *Department of Fisheries and Forestry* – administration of the Fisheries Act:

3. *Department of National Health and Welfare* – safety of water for human consumption; sanitary waste disposal;

4. *Department of Public Works* – navigation channel improvements, harbour facilities;

5. *Department of Transport* – meteorological network; Navigable Waters Protection Act.

### TERRITORIAL WATER BOARDS

Implementation of the Northern Inland Waters Act and the Dominion Water Power Act is under the regional direction in each of the Territories of a Water Board. Membership of the Board includes one person from each of the Federal Government Departments concerned with the water

resources of the Territories, plus three persons from each of the two Territories, under the chairmanship of the Regional Engineer of the Department of Indian Affairs and Northern Development. Boards are responsible for processing applications for a Water Rights Licence, for setting conditions in licences relating to water use and pollution control, for conducting public hearings, maintaining water management records and generally enforcing the Acts and Regulations.

**4–2.1.3 – Northern Canada Power Commission**

The Northern Canada Power Commission is a Crown Corporation concerned with the planning, construction and management of public utilities on a commercial basis. The Commission operates under Authority of the Northern Canada Power Commission Act, which empowers it to survey utility requirements, construct and operate public utility plants in the Northwest Territories, Yukon Territory, and subject to the approval of the Governor in Council, elsewhere in Canada.

It is a requirement of the authorizing Act that projects undertaken by the Commission shall be self-sustaining. Consequently, rates charged for utilities supplied must provide sufficient revenue to cover interest on investments, repayment of principal over a period of years, operating and maintenance expenses and a contingency reserve.

The Commission is engaged in four main types of operations, including provision of electric service, provision of central heating, provision of water and sewerage and contract work.

In 1970 it was operating 21 electric power plants, five of which were hydro and sixteen diesel.

Contract work related to the construction of utility services and repairs and maintenance of electric equipment for government departments, as required on a recoverable basis.

The Commission was formed in June 1948 under authority of the Northwest Territories Power Commission Act for the purpose of constructing and operating electric power plants in the Northwest Territories for mining and other interests. In 1949 the Act was amended to extend its provisions to include the Yukon Territory. In 1956 the name of the Commission was changed to "Northern Canada Power Commission."

Today the N.C.P.C. is the largest supplier of power in the North and is responsible for approximately 90% of the generation power North of 60. Among its major industrial customers is the Pine Point Mine on Great Slave Lake; United Keno Hill Mines near Mayo, Y.T.; and the Anvil Mine, northeast of Whitehorse, Y.T.

In addition to these large mines, power is also provided for several gold mines such as the Giant Yellowknife and the Con Mine at Yellowknife; and for silver and copper mines such as the New Imperial Mines near Whitehorse.

Power rates vary from under 1 cent per KWH on a wholesale basis, to as high as 20 cents per KWH in remote outlying areas, on a domestic basis. The average cost per KWH is under 2 cents and under 6 cents per KWH for domestic power where the Commission provides the necessary local distribution lines to each residence.

With the rapid development of the North it would appear that, in the public interest, the future role of the Commission will include the provision of large generating and long-distance transmission facilities in order to deliver electrical power to consumers at minimum cost.

The Commission already has the basic system for minor power grids in the Yukon, centered at Whitehorse, with its existing transmission line some 225 miles to the Anvil Mine at Faro, Y.T., and in the Northwest Territories where a minor power grid is developing in connection with the Pine Point Mine operation which could be extended to Fort Resolution. At Yellowknife an existing hydro and diesel system supplies power to the city of Yellowknife and the mines in the area.

Studies are now being conducted to ascertain the feasibility of extending existing power generation and transmission systems and integrating these into a single power grid for the entire Yukon Territory and one or more moderate sized power grids for the Mackenzie River Valley section of the Northwest Territories.

For further information write:

Mr. John M. Lowe,
General Manager,
Northern Canada Power Commission,
251 Bank Street,
Ottawa, Ontario.

**4–2.1.4 – Stream Flow Records**

The Federal Government operates a network of 85 metering stations in the Yukon and Northwest Territories to provide stream flow records on major rivers in the area. This program includes the establishment of approximately 17 new stations each year for the next three years.

**4–2.1.5 – Water Quality Sampling**

The Water Quality Division of the Inland Waters Branch of the Department of Energy, Mines and Resources has installed a limited number of quality sampling stations North of 60 as part of a national water quality sampling network. At present 37 stations are in use. In addition a program of water sampling in streams adjacent to producing mines has been started.

TABLE 4-1

NORTHERN CANADA POWER COMMISSION
PRESENT CAPACITY AND KILOWATT HOUR OUTPUT, 1970

| Plant | Utilities | Capacity | KWH Output |
|---|---|---|---|
| **NORTHWEST TERRITORIES** | | | |
| Taltson (Hydro) | Power | 18,000 KW | 110,507,360 |
| Fort Smith Distribution System (Diesel and Gas Turbine) | | 2,460 KW | |
| Inuvik (Diesel) | Power, Heat Water, Sewerage Mtce. Services | 4,500 KW | 15,742,200 |
| Fort McPherson (Diesel) (Operated for N.W.T. Gov't) | Power, Heat Water, Sewerage Mtce. Services | 750 KW | 1,288,310 |
| Fort Simpson (Diesel) | Power, Heat Water, Sewerage Mtce. Services | 1,225 KW | 2,783,924 |
| Aklavik (Diesel) (Operated for N.W.T. Gov't) | Power | 760 KW | 1,027,300 |
| Frobisher Bay (Diesel) | Power, Heat Water, Sewerage | 5,045 KW | 12,107,295 |
| Fort Resolution (Diesel) | Power | 450 KW | 855,680 |
| Chesterfield Inlet (Diesel) | Power | 400 KW | 334,320 |
| Snare River (Hydro) (Snare Rapids) (Snare Falls) | Power | 14,000 KW | 89,075,060 |
| Standby Diesel | | 6,150 KW | |
| Cambridge Bay (Diesel) | Power | 1,200 KW | 1,996,760 |
| Coppermine (Diesel) | Power | 600 KW | 885,135 |
| Baker Lake (Diesel) | Power | 1,354 KW | 2,242,734 |
| Fort Good Hope (Diesel) (Part Year) | Power | 375 KW | 268,942 |
| **YUKON TERRITORY** | | | |
| Mayo (Hydro) | Power | 5,000 KW | 27,004,960 |
| Whitehorse (Hydro) | Power | 20,000 KW | 109,333,000 |
| (Diesel) | Power | 9,000 KW | |
| Dawson (Diesel) (Water & Sewerage for Y.T. Gov't) | Power Water, Sewerage | 1,250 KW | 2,331,200 |
| Norman Wells (Gas Turbine) | Power | 700 KW | 1,983,250 |
| (Diesel) | | 800 KW | |

Consolidated approximate Gross Operating Revenue (All Plants) $9,650,000

## 4–3.1 – EXISTING HYDRO-ELECTRIC GENERATING FACILITIES

### 4–3.1.1 – Yukon Territory

Three organizations are engaged in the generation, transmission and distribution of electrical energy for public consumption in the Yukon Territory.

The Northern Canada Power Commission (NCPC) operates 85 per cent of the electrical generating capacity, including the two major hydro plants in the Territory at Whitehorse and on the Mayo River. The Commission has also constructed and operates the transmission lines connecting Whitehorse and Faro, a distance of 225 miles.

The Yukon Electrical Company undertakes the bulk of electricity distribution in the territory, procuring much of the distributed power from NCPC (in the Whitehorse area.) The Company also operates a number of thermal power plants in smaller communities throughout the Yukon, and distributes the power to local users.

The Yukon Hydro Company, affiliated with Yukon Electrical, operates two small hydro generating plants on Porter and MacIntyre Creeks near Whitehorse.

There are 300 miles of transmission line in the Territory, along four separate routes. (See Table 4-3)

At the present time, the Yukon Territory has a total installed electrical generating capacity of just over 40,000 KW, of which 90 per cent is produced by harnessing water power. The hydro generating capacity of the Territory is immense, however, and current utilization of the potential capability is but a "drop in the bucket". Since the mid-1940's, a number of surveys have revealed quantitatively the tremendous hydro-electric power resources of the Yukon. (See Table 4-4)

The surveys do not include development of the headwaters of the Yukon River by diversion to tidewater. Preliminary studies have indicated that up to 3,000,000 kilowatts of generating capacity could be developed although such a project would greatly reduce the hydro capacity of the Central Yukon.

### 4–3.1.2 – Northwest Territories

Three organizations are engaged in the generation, transmission and distribution of electrical energy for public consumption in the Northwest Territories.

The Northern Canada Power Commission operates 90 per cent of the electrical generating in the Territory, and has constructed and maintains 300 miles of transmission line from the two major hydro developments in the Territory on the Snare and Taltson Rivers to users in Yellowknife, Fort Smith and Pine Point. The Commission also operates a number of thermal plants at communities throughout the Territory, and distributes the power to local users.

Northland Utilities Limited generates and distributes power for the communities of Hay River, Fort Providence and Enterprise.

Plains Western Gas and Electric Company is engaged in distribution of electrical power to users in Yellowknife. In addition, the Departments of Indians Affairs and Northern Development, and Transport operate generating and distribution systems in a number of far northern communities not serviced by NCPC or the private sector. (See Table 4-5)

An additional 16,500 KW of thermal power is produced and distributed in 39 communities by federal government departments and mining corporations.

At the present time, the Northwest Territories have a total installed generating capacity of approximately 80,000 KW, of which 45 per cent is produced by harnessing water power. The hydro generating capacity of the Territories' rivers is considerable, however, and greatly exceeds current requirements. Since the mid-1950's, a number of surveys have been conducted and enabled a quantitative assessment of the undeveloped hydro power resources of the Northwest Territories.

TABLE 4-2

YUKON ELECTRIC POWER INDUSTRY

1. NORTHERN CANADA POWER COMMISSION

| Location | Service | Generating Capacity (KW) and Type |
|---|---|---|
| Whitehorse | Generation | |
| | Transmission | 20,000 hydro |
| | (Faro) | 10,000 thermal |
| Mayo | Generation | |
| | Transmission | 5,100 hydro |
| | (Elsa, Keno City) | |
| Dawson City | Generation | |
| | Distribution | 1,250 thermal |
| | Total | 36,350 |

2. YUKON ELECTRICAL COMPANY

| Location | Service | Generating Capacity (KW) (all thermal) |
|---|---|---|
| Whitehorse | Distribution and Transmission (Carcross) | |
| Watson Lake | Generating and Distribution | 1,480 |
| Carmacks | " " | 450 |
| Destruction Bay | " " | 500 |
| Haines Junction | " " | 550 |
| Teslin | " " | 500 |
| Beaver Creek | " " | 310 |
| Ross River | " " | 260 |
| Old Crow | " " | 150 |
| Stewart Crossing | " " | 100 |
| Pelley River | " " | 100 |
| Swift River | " " | 200 |
| Carcross | Distribution | |
| Keno City | " | |
| Upper Liard | " | |
| | Total | 4,600 |

3. YUKON HYDRO COMPANY

| Location | Service | Generating Capacity (KW) (all hydro) |
|---|---|---|
| Whitehorse | Generation | 1,650 |

## TABLE 4-3

## YUKON TRANSMISSION LINES

| Route | Distance (miles) | Voltage | Owner |
|---|---|---|---|
| Whitehorse to Carcross | 42 | 23 KV | Yukon Electric |
| Whitehorse to Carmacks | 100 | 69 KV | N.C.P.C. |
| Carmacks to Faro | 125 | 138 KV | N.C.P.C. |
| Mayo to Keno City | 32 | 69 KV | N.C.P.C. |

## TABLE 4-4

## YUKON POWER RESOURCES

| Area | Sites Identified | Estimated Installed Capacity (KW) |
|---|---|---|
| 1. Central Yukon | | |
| a) Main Stem – Yukon River | 10 | 4,477,000 |
| b) Tributary Rivers | 26* | 1,480,000 |
| 2. Watson Lake area | 3 | 410,000 |
| 3. Fort Liard area | 2 | 125,000 |
| | Total | 6,492,000 |

*estimated unit cost of power less than 25 mills per kilowatt hour (1967)

## TABLE 4-5

## NORTHWEST TERRITORIES ELECTRIC POWER INDUSTRY

### 1. NORTHERN CANADA POWER COMMISSION

| Location | Service | Hydro Generating Capacity (KW) |
|---|---|---|
| Yellowknife (Snare River) | Generation and Transmission | 14,000 hydro |
| Twin Gorges (Taltson River) | Generation and Transmission (Ft. Smith and Pine Point) | 18,000 hydro<br>32,000 |

| Location | Service | Thermal Generating Capacity (KW) |
|---|---|---|
| Yellowknife | Generation | 6,000 |
| Frobisher Bay | Generation and Distribution | 6,000 |
| Inuvik | " " | 4,500 |
| Fort Simpson | " " | 1,500 |
| Baker Lake | " " | 1,400 |
| Cambridge Bay | " " | 1,200 |
| Fort Smith | " " | 1,000 |
| Norman Wells | " " | 900 |
| Fort McPherson | " " | 750 |
| Aklavik | " " | 750 |
| Coppermine | " " | 600 |
| Fort Resolution | " " | 450 |
| Chester Field Inlet | " " | 400 |
| Fort Good Hope | " " | 400 |
| Pine Point | Distribution | |
| | Total | 25,900 |

### 2. NORTHLAND UTILITIES LIMITED

| Location | Service | Thermal Generating Capacity (KW) |
|---|---|---|
| Hay River | Generating and Distribution | 2,500 |
| Fort Providence | " " | 150 |
| Enterprise | " " | approx. 100 |

TABLE 4-6

NORTHWEST TERRITORIES POWER RESOURCES

| Area | Sites Identified | Estimated Installed Capacity (KW) |
|---|---|---|
| 1. North West Cordillera Region | 2 | 1,150,000 |
| 2. South West Cordillera Region | 5 | 955,000 |
| 3. Lower Dubawnt-Kazan Basin | 6 | 398,000 |
| 4. Thelon-Hanbury Basin | 4 | 320,000 |
| 5. Lockhart River | 6 | 329,000 |
| 6. Coppermine River | 6 | 278,000 |
| 7. Tazin River | 3 | 26,000 |
| | Total | 3,456,000 |

## 4–4.1 – POTENTIAL HYDRO-ELECTRIC GENERATING SITES

Four reports on electric power potential in the Yukon and Northwest Territories are available to the public at $15.00 each (French and English):

1. Hydro-electric resources Survey of the Central Yukon Territory (2 volumes)
2. Power Survey of the Central Mackenzie District (2 volumes)
3. Power Survey of the Liard River Basin, Yukon and Northwest Territories
4. Power Survey of the Kazan, Dubawnt, Thelon and Hanbury Rivers, Northwest Territories.

Inquiries may be directed to:

Director,
Northern Economic Development Branch,
Dept. of Indian Affairs & Northern Development,
400 Laurier Ave., W.,
Ottawa 4, Ontario.

# north of 60

## forestry

northern economic
development branch
department of indian affairs
and northern development
government of canada

## INDEX

## FORESTRY NORTH OF 60



**Maps**



**Table**



Revised April, 1971.

# FORESTRY NORTH OF 60

## 5–1.1 – GENERAL

The forests North of 60 remain an almost untapped resource. An estimated 77,000 square miles of productive forest in the Yukon and the Mackenzie District of the Northwest Territories hold an estimated 23 billion cubic feet of merchantable timber.

Because the Territorial forests are spread over such a vast area it has not yet been possible to complete a total inventory of all the timber resources. The Federal Government is now gradually expanding and updating inventory figures based on actual sampling of the more accessible stands of timber. By careful estimation of the remainder, foresters have calculated that the Northwest Territories have a minimum of 14 billion cubic feet of merchantable timber, and the Yukon Territory 9 billion cubic feet.

The northern limit of tree growth in the Territories is marked by the "tree line" which runs roughly along a line southeast from the mouth of the Mackenzie River, on the Beaufort Sea, to Churchill, Manitoba, on Hudson Bay (Map 5–1). The Territorial forests are classified within the regional system of Canadian forests as the Boreal region. The most common species in the region are white and black spruce, lodgepole and jackpine, balsam poplar, trembling aspen and white birch. Also found are balsam fir and tamarack.

Up to the present time white spruce has been the only commercial species exploited to any extent North of 60. The best stands are found on the alluvial flats of the rivers where excellent growing conditions and natural fire protection have allowed the trees to reach maturity at 150 years. It is not uncommon to find spruce over 24 inches in diameter and 100 feet tall along the Lower Slave River in the Mackenzie District, or on the Liard River in the Yukon Territory and the Mackenzie District.

Mature white spruce average between 20,000 – 25,000 board feet per acre. In some instances these stands have yielded as high as 40,000 board feet per acre.

Associated with the spruce is the balsam poplar which may grow to 30 inches in diameter. Studies have shown balsam poplar can be peeled for plywood, but it has so far not been economically feasible. Generally, the balsam stands are restricted to the southern half of the Yukon Territory and the southern third of the Mackenzie District.

Jackpine is believed to be the most common species North of 60, covering thousands of square miles in both Territories. Individual trees seldom attain a diameter greater than 14 inches. However, some early estimates suggest the jackpine may occur in sufficient volumes in some areas to sustain a pulp mill.

The rotation age of the forest varies widely, ranging from 200 years for spruce in the Mackenzie Delta area near the Arctic Ocean, down to 120 years for spruce, 90 years for pine and 70 to 80 years for poplar in the Southern Regions. These latter are probably equivalent to similar stands in central Alberta and British Columbia.

In addition to its value for commercial purposes, the forest resource North of 60 has considerable value in relation to game preservation, erosion control, and to the general aesthetics of the area.

## 5–2.1 – DEVELOPMENT

Up to the present time industrial utilization of the northern forests has been relatively small in comparison to non-renewable resource development but the value of the northern forests for the production of timber products and as a part of the natural environment is now beginning to emerge.

In recent years there has been a marked increase in the number and size of forest operations in the Territories and the demand for timber is continuing to increase, but forest production has been geared to supply limited local markets only with a portion of the Territories requirements being supplied from the south. This, however, is not indicative of what the northern forests could actually produce if called upon to do so, and forest-based industries would appear to have considerable potential for future development. It is estimated that the softwood allowable cut for the Territories could exceed 40 million cubic feet annually although full development of this potential will depend upon the establishment of economic markets and transportation facilities. Also, a large proportion of this annual cut is made up of small diameter wood only suitable for pulp or some other fibre process and it may perhaps be in this area that the forest resources of the North will find their principal use in the future.

Recent developments in timber harvesting methods, combined with increasing demand for forest products have stimulated forest industries interest in the North, with a number of new firms having already become established, and the prospect of large-scale integrated forest products operations appears likely within the next few years. These increasing demands are expected to result in improved quality of northern forests products and raises the necessity of better managed forests and efficient forest industry North of 60.

In order to ensure proper management of the forest resource and provide adequate timber supplies to meet large capital investments by industry, procedures are being developed for the allocation of large-scale cutting rights over extended time periods of up to ten years.

## 5–3.1 – ADMINISTRATION

The Northern Economic Development Branch of the Department of Indian Affairs and Northern Development is responsible for the management of the forest and forest land resources North of 60. These responsibilities include timber management and administration, forest protection, and construction and maintenance of public campgrounds along the Territorial highways, the regulation of surface land use operations.

Development Branch policies are implemented by the Yukon Forest Service, with headquarters in Whitehorse, Y.T., and the Mackenzie Forest Service, with headquarters in Fort Smith, N.W.T.

The Forest Services were organized in the 1940's, primarily as forest protection and fire suppression units. Gradually, they were expanded to include timber administration. General improvements, carried out over the years, have led to the present modern, relatively well-equipped organizations.

Forest management offices have been established in each of the various administrative districts of the two Forest Services. The resident officer is the Federal Government's forestry representative in that area. In addition, rangers, summer seasonal personnel and lookout men are positioned at strategic points during the fire season. (See map 5–2, 5–3).

Because of the large areas involved and the limited number of personnel and communication roads a system of protection priorities has been established. The system is based on the relative values of the property protected. The areas of priority are mainly those in which the highest concentration of value exists, these being near communities, areas of high timber volume, young growth of potential value and along the main travel routes. The degree of protection, however, varies from year to year, depending on hazard conditions and the availability of manpower and equipment.

Fire suppression is also often considered warranted on both non-productive forest land and non-forested land in the interests of protection of wildlife and the continuity of trapping, which is still important to a segment of the indigenous population. Protection priorities are regularly assessed and changed when necessary.

Beginning in the 1950's the two Services established a number of public campgrounds in the Territories, with the object of concentrating campers in a few locations and thereby reducing fire risk. Choice of site now depends on each location's scenic attractiveness rather than its fire prevention potential. These campgrounds – at present there are 25 roadside stopping places in the Northwest Territories and 43 in the Yukon Territory – are attracting an increasing number of tourists each year.

In the past the Forest Services have been responsible for the development and maintenance of campground facilities but these responsibilities are now being transferred to the Territorial Governments. Construction and maintenance costs of the campgrounds are shared by the Federal Government and Territorial Governments.

### 5–3.1.1 – Regulations

The forests of the Yukon Territory and the Mackenzie District are a Federal responsibility. They are administered under the Federal Territorial Lands Act and by the Territorial Timber Regulations issued under authority of the Act. The Act and Regulations bear

out the basic policy of the Federal Government with respect to the northern forests; that is, the encouragement of the best possible utilization of the resource and the assurance of a reasonable return in the form of royalties, stumpage and rentals.

The Territorial Timber Regulations govern the cutting and removal of timber on Territorial lands in the Yukon and Northwest Territories and cover the issuing of permits, the seizures of timber products, the general requirements for forestry operators and the dues payable to the Federal Government for timber cut.

Legislation for forest protection is handled by each Territory through its own Forest Protection Ordinance, formulated and passed by the councils of the Yukon and Northwest Territories. Traditionally, the councils have made forest protection their own legislative responsibility, even though the Territorial forests are administered by the Federal Government.

The Yukon Forest Protection Ordinance and the Northwest Territories Forest Protection Ordinance are similar in content and are concerned with such areas as the appointment, powers and duties of forestry officers, regulations, general protection and prohibitions, closed seasons and assistance in fire fighting. The ordinances provide for the establishment of a closed season each year, normally from May 1 to September 31, during which fires may not be lit without first obtaining a permit.

For further information write:

Administrator of Northern Forests,
Northern Economic Development Branch,
Department of Indian Affairs
and Northern Development,
400 Laurier Avenue,
Ottawa, Ontario.

Superintendent,
Yukon Forest Service,
Whitehorse, Y.T.

Superintendent,
Mackenzie Forest Service,
Fort Smith, N.W.T.

TABLE 5-1

WOOD UTILIZATION IN THE
YUKON AND NORTHWEST TERRITORIES
1961 – 1970

| Fiscal Year | Territory | Lumber (fbm) | Round Timber (lineal feet) | Fuelwood (cords) |
|---|---|---|---|---|
| 1961-62 | N.W.T. | 1,049,000 | 584,000 | 1,410 |
| | Y.T. | 4,037,842 | 918,987 | 6,249 |
| 1962-63 | N.W.T. | 2,060,055 | 17,000 | 3,741 |
| | Y.T. | 8,096,274 | 2,103,375 | 6,892 |
| 1963-64 | N.W.T. | 2,271,533 | 50,134 | 3,944 |
| | Y.T. | 8,999,037 | 2,723,456 | 5,902 |
| 1964-65 | N.W.T. | 1,358,295 | 184,275 | 2,501 |
| | Y.T. | 6,557,695 | 2,308,751 | 8,677 |
| 1965-66 | N.W.T. | 2,522,947 | 251,268 | 8,645 |
| | Y.T. | 2,654,054 | 1,197,300 | 6,798 |
| 1966-67 | N.W.T. | 3,501,600 | 427,130 | 8,295 |
| | Y.T. | 5,213,882 | 1,626,296 | 8,411 |
| 1967-68 | N.W.T. | 2,365,877 | 436,575 | 8,434 |
| | Y.T. | 7,049,647 | 427,486 | 8,545 |
| 1968-69 | N.W.T. | 2,736,062 | 128,555 | 1,023 |
| | Y.T. | 7,680,707 | 1,150,690 | 10,080 |
| 1969-70 | N.W.T. | 5,089,776 | 295,670 | 1,457 |
| | Y.T. | 12,058,470 | 650,583 | 6,084 |

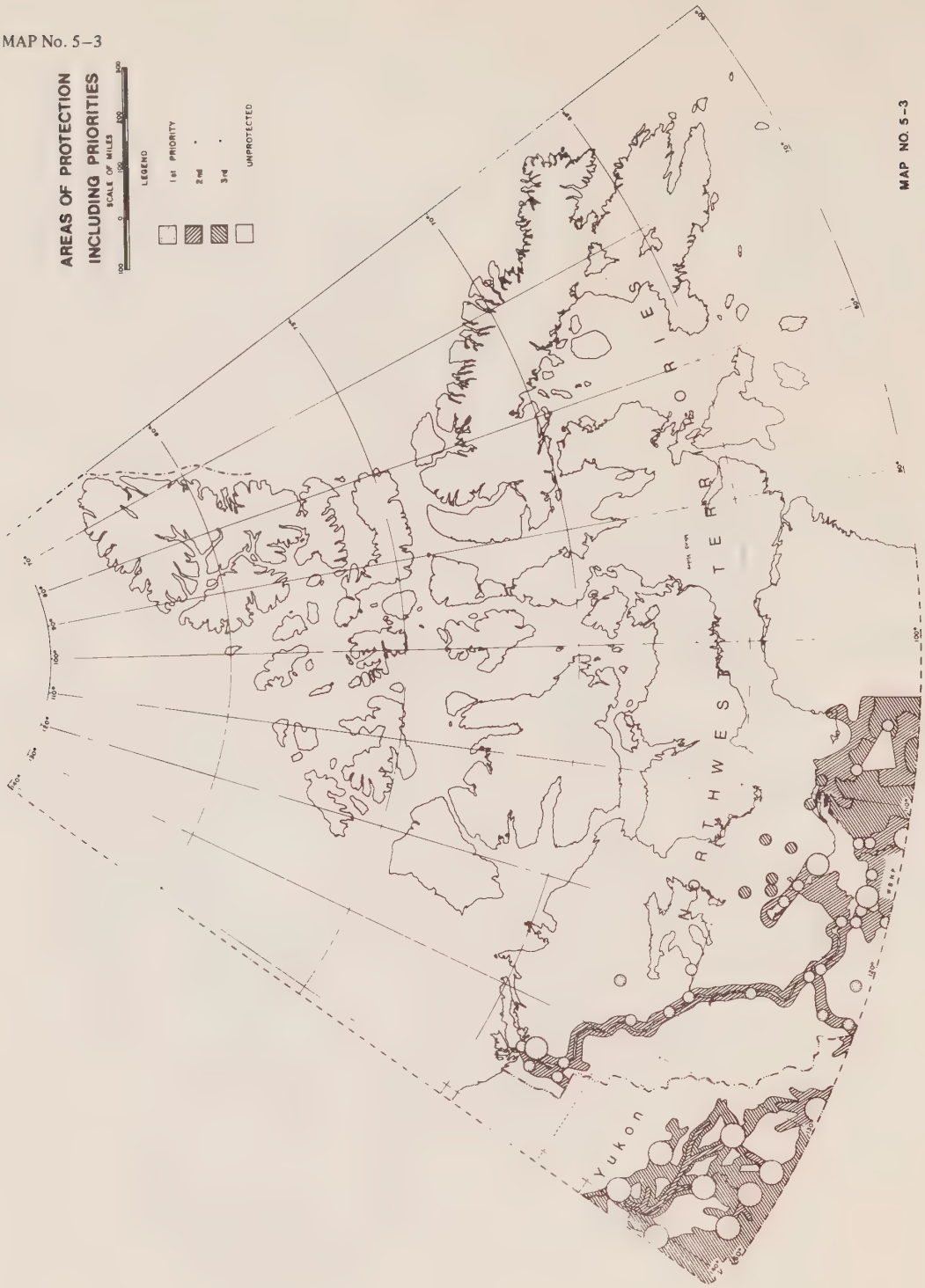

MAP NO. 5-1

MAP No. 5-1


MAP NO. 5-2

MAP No. 5-2

MAP No. 5–3




MAP NO. 5–3


# north of 60

northern economic
development branch
department of indian affairs
and northern development
government of canada

## INDEX

## LAND NORTH OF 60



Revised April, 1971.

# LAND

## 6–1.1 – GENERAL LAND USE MANAGEMENT

"Land use" as applied in this section refers to land conservation and protection.

Due to the accelerated rate of exploration and development activity in the northlands and the adverse effects this activity can have upon the northern ecosystem it has become necessary to apply some measures of control over these activities in order to minimize surface disturbances, and also to provide liaison between northern residents, particularly Eskimos and Indians, and industrial organizations engaged in resource development activities in the North.

Consideration is given to human and social needs as well as economic development requirements.

## 6–2.1 – ADMINISTRATION

The Land Use Management Section is organized under the Water Lands and Forests Division, Northern Economic Development Branch, Department of Indian Affairs and Northern Development. Application for a permit to carry out a land use operation can be obtained from the Regional offices situated at Yellowknife and Whitehorse. Permits are also issued from these Regional offices.

## 6–3.1 – REGULATIONS

### 6–3.1.1 – Northern Land Use Regulations

The Northern Land Use Regulations have been promulgated under authority of amendments to the Territorial Lands Act passed during the 1970 session of Parliament. These regulations set out and provide authority for the enforcement of rules and procedures to be followed by all individuals and companies carrying out operations on Territorial lands. The regulations are designed to prevent needless damage to the northern environment and to protect the unique physical characteristics and the fragile ecological balance of the region.

The regulations are divided into three parts. Part I sets out regulations pertaining to land use which apply throughout the Yukon Territory and the Northwest Territories. Part II sets out regulations that, in addition to the general regulations will apply within Land Management Zones. These Land Management Zones will be areas designated by the Governor-in-Council under authority of the amended Territorial Lands Act and will cover areas of special environmental sensitivity and concern. Within a Land Management Zone, and only in these areas, all operators will be required to obtain a land use permit prior to commencement of land use activities on public lands.

Part III of the regulations deals with the powers of officials administering the regulations, penalties, appeals and procedures.

The Land Use Regulations are designed to set ground rules to exploration and development activities on northern lands, but in no way prohibit or exclude such undertakings.

## 6–4.1 – RESEARCH

### 6–4.1.1 Arctic Land Use Research

The Arctic Land Use Research (ALUR) program has been established by the Department of Indian Affairs and Northern Development to detect and define environmental problems affecting land use and to devise and test alternative land use operational procedures.

The program, commenced in 1970, has begun a series of mission oriented scientific projects such as to determine the effects of different types of tracks of vehicles employed in the Arctic, the effects of oil spills on tundra vegetation, plant regeneration on seismic line disturbances, mine waste containment as well as a number of environmental surveys to establish base line data. Results obtained from these projects are made available to interested members of the public, agencies, universities and researchers. These results are also used by the department to determine the type and degree of restrictions that will be applied under the Land Use Regulations to achieve the minimum degradation of the natural landscape during resource exploration and development.

Research projects commissioned through the ALUR program are usually conducted by senior university researchers and in a number of instances are joint cooperative projects with industry. Well over $500,000 will be spent in 1971-72 to conduct research projects on environmental problems in both the Yukon and Northwest Territories. Land Use Research establishments have been centred at Watson Lake, Y.T., Yellowknife, N.W.T. and Tununik, N.W.T. to provide scientific instrumentation support to the projects.

It is envisaged that the ALUR program will contribute a strong scientific support to the land use regulations as well as making a significant contribution to the scientific knowledge of the Arctic.

## 6–5.1 – GENERAL

The Yukon and Northwest Territories are not agricultural areas. A number of factors are involved, such as the limitation of crop growth by short growing or frost-free seasons, unsuitability of most of the land area for cultivation and high transportation costs.

Consequently, farming on a successful full-time basis has limited possibilities, both from the technical and economic point of view. Although there are some potential agricultural areas in the region, attempts at farming will be confined for a long time to specialized and marginal operations.

Despite these land utilization problems, land use has accelerated in recent years. For example, there were 577 land leases and agreements of sale in force at March 31, 1953, compared to 1,384 at March 31, 1970, with many of the earlier sale transactions being completed in the intervening years.

The best growth potentials are to be found in those activities which are dependent on land, such as industrial and urban expansion, outdoor recreation, trapping, hunting and fishing. (See map 6–1).

### 6–5.1.1 – Administration

Jurisdiction over vacant lands in the Yukon and Northwest Territories is exercised by the Federal Government and the appropriate Territorial Government. All Crown lands under the control and management of the Minister of Indian Affairs and Northern Development are administered pursuant to the Territorial Lands Act and the Territorial Lands Regulations.

An extensive administrative organization has been established by the Department to implement the Act and Regulations. Land Offices are located at Watson Lake, Whitehorse, Mayo and Dawson in the Yukon Territory, and at Fort Smith, Hay River, Pine Point, Yellowknife, Fort Simpson and Inuvik in the Northwest Territories.

Area administrators in many of the smaller settlements and townsites will also accept applications to lease or purchase lands.

To improve the service to those interested in land use, in the Yukon the administration of leases and agreements for sale has been transferred from Ottawa to Whitehorse. A similar decentralization to Yellowknife for the administration of leases and sale agreements in the Northwest Territories is scheduled for 1971.

Administration of all Crown-owned lands in and immediately surrounding the established communities is being transferred to the Territorial Governments under a 5-year program. These "Territorial" lands are administered by the Commissioner of the Yukon Territory or the Northwest Territories, as appropriate, pursuant to the Yukon Territorial Lands Ordinance or the Northwest Territories Commissioner's Land Ordinance.

### 6–5.1.2 – Land Disposal Policy

Vacant land North of 60 is available to any person over 19 years of age and to any corporation for any legitimate purpose. The basic aim of the land policy is to make land available when and where it is required, consistent with the protection of the public interest.

One of the main principles of land policy is that initial occupation must be authorized by a lease or an agreement for sale. Only in extenuating and unusual circumstances will consideration be given to granting title until specified improvements have been made.

In most cases this involves the construction of buildings or other structures directly related to the indicated land use.

An agreement for sale is issued for a term of five years and leases may be granted for any period up to 30 years.

Appropriate stipulations are inserted in the leases and sale agreements as required, to protect the environment against pollution and other ecological hazards.

Other aspects of land policy:

The area of any parcel leased or sold shall not exceed what is reasonable for the purposes for which the land is to be used.

Title to the land may not be issued until the land has been surveyed and the plan registered. Cost of the survey must be paid by the purchaser.

Land within 100 feet of the high water mark of a body of water may be leased but cannot be sold.

Under normal circumstances, a lessee, upon expiration of his lease may obtain a renewal, or if a renewal cannot be granted or is not required, he may remove his improvements from the land and is given a stated time in which to do this.

Under an agreement for sale the purchaser may pay for land in five equal annual installments and provided the terms and conditions of the agreement have been met may then obtain title.

Any person desiring to acquire land must select the parcel of land he desires. Agents in the land offices are always willing to assist the applicant in this task.

No lease or agreement for sale of land includes mines and minerals including oil and gas, merchantable lumber or the bed of any lake or stream.

The sale and leasing of Crown lands, other than lands suitable for grazing or muskrat farming, are limited to 160 acres and 640 acres respectively to any one person unless otherwise approved by the Governor in Council.

Not more than 6,400 acres of lands suitable for grazing or muskrat farming may be leased to any one person without the approval of the Governor in Council.

Lands suitable for muskrat farming may not be sold.

The annual rent payable under all leases is set at not less than 10% of the appraised value of the land or $25.00, whichever is greater.

### 6–5.1.3 – Residential, Commercial and Industrial Lands

Land for residential, commercial or industrial use may be occupied under a lease or an agreement for sale. The occupant is given two years in which to complete a house or other improvements to the land. When the required improvements have been completed he may apply to have the land surveyed and to purchase it. The prices at which these types of land are sold vary according to the location of the land with respect to the nearest settlement, highway, lake or river, airport, etc.

Where warranted, industrial parks have been established, such as those at Whitehorse, Y.T., and Pine Point, Hay River, Inuvik, Fort Simpson and Yellowknife, in the N.W.T.

Lands for sport fishing camps and similar tourist establishments are normally leased for an initial term of five years, including the main camps or lodge sites and the outpost camps operated in conjunction with the main establishment. In all cases the granting of building permits and business licences by the Territorial Governments are prerequisites to the issue of leases or subsequent renewals.

## 6–6.1 – AGRICULTURAL LANDS

Because of the extremes in climate and high costs of transportation to and from the Territories farming is expensive, and obtaining loan capital at reasonable rates of interest is difficult. As a result, homesteads are not authorized North of 60. However, if a person wishes to undertake full-time farming and has the financial resources to see him through the initial years before a return on the land can be realized, he may apply for land up to 160 arable acres within an area designated by the Department of Agriculture as being suitable for farming. Initial occupation is under a lease issued for a five-year term with the lessee being required to construct a house and to place a stated acreage under cultivation before the lease expires. The lease may contain an option to purchase at prices determined at the time of application when the land is inspected. Prices are based on the following minimum figures:

| | |
|---|---|
| Class 1: Land open or easily cleared | $5.00 per acre |
| Class 2: Land requiring moderate clearing | $3.00 per acre |
| Class 3: Land not included in classes 1 or 2 | $1.00 per acre |

When the improvements specified in the lease have been completed, the lessee may apply to have the land surveyed and subsequently purchase it.

### 6–6.1.1 – The Yukon Territory

Agriculture in the Yukon goes back to the days of the Klondike Gold Rush of the 1890's, but no significant expansion has ever taken place. In addition to the limiting factors of weather and soil, the region, at present, is too remote from major urban markets and sources of supply to warrant volume production. Transportation costs are a significant obstacle in obtaining agricultural needs and shipping produce. In addition, the Territory lacks the necessary local markets which could support specialty products.

Yukon agricultural soils occur only in intermittent pockets and narrow bands along main rivers and their tributaries. To assess the amount of land suitable for agriculture a number of field studies have been completed by the Department of Agriculture.

The following areas are considered potentially suitable for agricultural use:

| | |
|---|---|
| Takhini and Dezadeash Valleys | 205,500 acres |
| Yukon River and Tributaries | 60,000 acres |
| Tagish and Little Atlin areas | 8,000 acres |
| Dawson area | 6,000 acres |

Most of this land is forest covered. In addition, the frost-free period is short and often there is insufficient moisture for rapid growth. This is offset, in part, by the extended periods of light which accelerates normal growth. Most of the soils in the Yukon are rather acid and natural fertility falls off rapidly. Despite such difficulties experience has shown that early varieties of grain and potatoes can be successfully grown in some places.

There is some small-scale truck gardening and mixed farming, particularly in the vicinity of Whitehorse, but, the raising of beef cattle is the main agricultural activity (most beef raised is consumed locally). Lands for market gardening are usually within a reasonable distance of a settlement and are required in relatively small parcels of 20 acres or less. As with all other lands occupation is, in the first place, authorized by an agreement for sale or a five-year lease with the usual requirements with respect to construction of a dwelling and the cultivation of a stated acreage within the five years. In the case of grazing lands, the land is not sold except for a parcel of up to 160 acres for the home site, ranch buildings and production of winter feed. The occupation of the actual grazing land is by lease only.

The 1961 Census showed that there were 33 separate parcels of land held in the Yukon for agricultural or grazing use under lease or agreement of sale. The total area involved was 10,300 acres. In addition, applications for another 33 parcels containing 10,600 acres were pending. The census listed 15 farms and reported the value of products sold at $15,600. About 12% of the farmland was classed as improved. By 1965 the area held for agricultural or grazing purposes by lease or agreement for sale had risen to 27,700 acres with applications for a further 3,000 acres pending. Most of the existing and pending agreements were for grazing only. At the end of March 1970 there were 55 leases for agricultural purposes involving approximately 2,500 acres, and 76 grazing leases comprising some 35,000 acres in force. Twenty-six of the agricultural sites were also used for residential purposes.

To assist in the development of agriculture in the Yukon the Canada Department of Agriculture operated an experimental farm at Haines Junction, Mile 1019 on the Alaska Highway from 1944 to March 31, 1970, when their research program was completed. Information on the results of the research studies is available from the Information Division of the Department of Agriculture at Ottawa.

### 6–6.1.2 – Northwest Territories

There are between 3,500,000 and 4,000,000 acres of arable land in the Northwest Territories. As in the Yukon, although the season is short, growth is assisted by the long summer days. Growth is further helped by the fact that permafrost aids in holding the available moisture in the ground.

Wheat and coarse grains give good yields and root vegetables, tomatoes, berries and tree fruits are grown successfully on a small scale. The Canada Department of Agriculture operated an experimental station at Fort Simpson on the Mackenzie River until March 31, 1970, when their research program was completed. Details of their studies are available from the Information Division of the Department of Agriculture at Ottawa.

The soils with agricultural potential are located in the District of Mackenzie. Soils in the Districts of Keewatin and Franklin are not suitable for agricultural use. As in the Yukon, the suitable soils are located mainly along river valleys. The major areas of potential use are along the Slave, Hay, Liard and Mackenzie Rivers.

The largest arable section of the Northwest Territories contains about 2,000,000 acres and is located along the Slave River, north of Forth Smith. The ratings of the soils in this area are as follows:

| Rating | Area of Arability Classes Acres | Percent |
|---|---|---|
| Class 1 (arable-no limitation) | 397,300 | 18.3 |
| Class 2 (moderate limitation) | 1,182,400 | 54.3 |
| Class 3 (requires intensive management) | 116,300 | 5.4 |
| Class 4 (non arable) | 356,000 | 16.2 |
| Lakes and Rivers | 127,000 | 5.8 |
| Total | 2,179,000 | 100.0 |

The lowlands adjacent to the Liard River are an extension of the more southerly Peace River Block and are considered to have a high potential. The soil ratings for this area are as follows:

| Rating | Area of Arability Classes Acres | Percent |
|---|---|---|
| Class 1 (arable-no limitation) | nil | |
| Class 2 (moderate limitation) | 75,900 | 5.6 |
| Class 3 (requires intensive management) | 378,500 | 28.1 |
| Class 4 (non arable) | 311,500 | 23.0 |
| Class 5 (limited capability) | 341,400 | 25.3 |
| Other | 243,400 | 18.0 |
| Total | 1,350,800 | 100.0 |

The potentially arable area on the Mackenzie River is estimated to contain approximately one million acres of agricultural land but no detailed classification is available for this area or for the potentially arable lands along the Hay River and along the shores of Great Slave Lake.

According to 1961 Census there was a total of 11 farms in the Northwest Territories with an overall acreage of 518 acres, of which 134 acres were classified as improved land. Twenty-three people were involved either full or part-time in agriculture and the total value of products sold in 1961 was $13,000.


NATURAL VEGETATION
SCALE OF MILES
100 0 100 200 300
LEGEND
Boreal forest
Alpine tundra
Subarctic forest tundra transition
Dwarf shrub-sedge-moss-lichen heath
Stony sedge-moss-lichen-tundra
Rock desert or fall-field
Existing glaciers

MAP No. 6–1

# north of 60

## tourism and recreation

northern economic
development branch
department of indian affairs
and northern development
government of canada

# INDEX

## TOURISM AND RECREATION

# TOURISM AND RECREATION NORTH OF 60

## 7–1.1 – GENERAL

Canada North of 60 is one of the world's last frontier regions, and therefore offers unique opportunities for both the investor and visitor. The Yukon and Northwest Territories offer a breathtaking range of scenery, from the towering mountains of the Yukon, to the broad sweep of the Mackenzie River valley, the rolling tundra and lake country of the Keewatin District and the glaciers of the Arctic Archipelago.

Within this varying land is an abundance of wildlife – the polar bear, caribou, muskox, seal and beluga whale. Sports fishing on the myriad of lakes is a major attraction.

The Eskimo and Indians, who make up more than half the 40,000 population of the Territories, are among the most colorful people in the world. Eskimo art, discovered and developed only in recent years, has had world-wide acclaim.

The growing search by North Americans for untouched wilderness, free of daily urban tensions and problems, combined with their mobility, has brought the Territories within comparatively easy reach. Consequently, the tourist industry is increasing at a tremendous rate.

The demand for better accommodation and more recreation facilities in the two Territories today provides many opportunities for potential investors. In the past the normal tourist season North of 60 lasted from June to August. However, the interest in the region has grown so rapidly that the season now runs from May to October.

With the expanded season, tourist facilities in both Territories are hard-pressed to keep up to the demand. During the peak of the summer season accommodation in the major centres is inevitably completely booked. In addition, the tourist service industry, such as restaurants and service stations, are overtaxed and must be expanded to meet tourist demand and business travel.

The Federal Government has recently moved to meet this problem by establishing a $5,000,000 small business loan fund, to assist entrepreneurs in both Territories in establishing and expanding such service industries as motels, hotels, restaurants and stores. It is the intention to make available initially $300,000 in each of the Territories each year for small loan purposes. This amount is expected to increase as the program expands.

Further information on the Small Business Loan Funds may be obtained from:

Director,
Territorial Relations Branch,
Department of Indian Affairs and Northern Development,
400 Laurier Avenue W.,
Ottawa 4, Ontraio.

## 7–2.1 – YUKON TERRITORY

Tourism is now the Yukon Territory's second largest industry, having grown from less than $2,000,000 in 1962 to more than $7,500,000 in 1968.

A study of the Yukon economy, commissioned by the Department of Indian Affairs and Northern Development* indicates the significance of the industry's economic potential. Although still seasonal, it acts as a balancing element in an economy dominated by the volatile and uneven growth of the Territorial mining industry.

The industry itself has been making a steadily increasing contribution to the economic growth of the Territory, and, as North Americans move greater distances to seek wilderness recreation the Yukon is proving to be particularly attractive to an increasing number of families who have the leisure and income to enjoy it.

The Yukon offers magnificent natural attractions to the tourist:

- the altitude and dryness of the air which seem to add a stimulant to the Yukon atmosphere.
- the great rings of mountains that surround the central plateau.
- the rugged hills within the central plateau.
- the majesty of the Yukon River and its tributaries.
- the calm beauty of the great lakes reflecting the hills behind.
- the wide forested valleys.
- the abundant wildlife.

The economic study indicated that 80 per cent of the tourists visiting the Yukon are from the United States, with California, Washington, Alaska and Michigan the largest contributors.

Between May and September, 1968, a total of 118142 visitors cleared Canadian customs, en route to the Yukon, an increase of 18 per cent over the same period in 1967.

The average length of stay has increased from 4.7 days in 1962 to 7.2 days in 1966. Approximately 75 per cent of the tourist visitors come to the Yukon by private car, 15 per cent by air and 10 per cent by bus. Bus package tours have become an increasingly popular way of seeing the Yukon.

Improved transportation routes are stimulating increased interest by wilderness seekers, particularly the new "marine highway". This route utilizes the British Columbia ferry system, roads on Vancouver Island, the Alaska State ferry system and the ports of Haines and Skagway, Alaska, from which highway access to the Yukon is available. Travellers on the marine highway may then return to southern Canada and the United States over the Alaska Highway.

Some approximate road distances to Whitehorse, YT. from:

| | |
|---|---|
| New York | 4100 miles |
| San Francisco | 2700 miles |

*The Yukon Economy D.W. Carr and Associates Ltd., Ottawa, Nov. 1968, Available from Queen's Printer.

| | |
|---|---|
| Seattle | 1800 miles |
| Vancouver | 1700 miles |
| Edmonton | 1287 miles |

A new 370–mile highway running between Watson Lake, Ross River and Carmacks offers a second route to Dawson, a mecca for tourists seeking relics of the spectacular Klondike gold rush days of the 1890s, and to Alaska. As traffic volume increases on this highway the demand for tourist services is bound to provide new opportunities for investors.

A network of 36 government campgrounds provides basic facilities for campers. The growing demand for sewer, water and hydro connections has encouraged construction of trailer parks by private operators in some areas.

At the present time there are 82 establishments providing a total of 1,364 sleeping units, with a capacity of approximately 4,000 persons throughout the Yukon. A total of 976 units are available in the following communities:

| | |
|---|---|
| Carcross | 22 units |
| Carmacks | 37 units |
| Dawson | 106 units |
| Haines Jct. | 41 units |
| Keno | 15 units |
| Mayo | 36 units |
| Teslin | 41 units |
| Watson Lake | 132 units |
| Whitehorse | 546 units |

An additional 71 units are planned for the Territory in 1969.

## 7–3.1 – NORTHWEST TERRITORIES

The tourist industry potential of the Northwest Territories is impressive. The acceleration of resource development activity, coupled with rapidly increased transportation facilities, and a general interest in the region, have combined to create a favorable climate for investment in the industry.

While still comparatively modest, the volume of tourists arriving in the Territories is growing annually, from 600 in 1959 to 9,000 in the 1968–69 fiscal year. Expenditures have increased from $350,000 to $3,100,000 in the same period.

Surveys taken in 1968 revealed that the average party size was 3.78 persons and the average length of stay 7.6 days. Average spending per party-day was $17.60 (the average Canadian party spent $14.93, the average United States party $20.12).

Nine out of every 10 tourists surveyed in 1968 had not been to the Northwest Territories before. Of the visitors, 54 per cent were Canadian, 42 per cent American and 4 per cent foreign. Half the visitors arrived by highway and 40 per cent made direct flights to a Territorial fishing lodge.

Sightseeing, photography, shopping, fishing and visiting museums proved to be the major tourist attractions, in that order.

Extension of the highway system linking the Territories to southern Canada and the United States has made such communities as Yellowknife, Enterprise, Hay River, Fort Smith, Pine Point, Fort Providence and Rae easily accessible by automobile. New extensions to Fort Resolution and Fort Simpson, to be opened in 1969, add to the list of possible tourist destinations.

The network of campgrounds and picnic sites, under the jurisdiction of the Division of Tourism and Outdoor Recreation, is being built up along the highway system. In 1968, 65 per cent of Territorial highway travellers used the campgrounds for overnight accommodation.

Scheduled and charter air service is available to tourists throughout the Territories. Jet service is available between Edmonton, Hay River and Yellowknife, and between Montreal and Frobisher Bay.

To meet the increasing demand of tourists, a Northwest Territories Tourist Office was organized in 1960 to assess tourist potential and promote development of tourist facilities and traffic. This office is now a part of the Territorial Government, under the Division of Tourism and Outdoor Recreation.

Tourist promotion is now carried on actively in Canada and the United States.

The Northwest Territories Tourist Association, representing carriers, operators and others interested in tourism, holds annual conferences to recommend new policies and programs for tourist development in the region.

The attractions of the Northwest Territories are unique and diverse. Big game hunting in the Mackenzie Mountains, opened in 1965, has become one of the major attractions among outdoorsmen, with Dall sheep, grizzly bears, moose and mountain goats

available for trophies. Sea mammal hunting is an increasingly popular experience, available in the eastern Arctic. License fees for seal are $20.00 non-resident Canadian and $25.00 for others; and for white whale, $20.00 non-resident Canadian and $20.00 for others.

Hunting and fishing in the Keewatin District is unusual and challenging. The season starts with seal hunting during the early part of May and continues over the spring break-up into the fishing season, usually beginning around June 25 and lasting until mid-September.

Hunting for seal on the edge of the ice floes involves travelling to and from the hunting grounds by dog team with an occasional overnight stay at an ice camp offshore in Hudson Bay.

Prolonged daylight during the summer months provides the outdoorsman with opportunity for round-the-clock activity. As the rivers race from the lakes at flood level toward the end of June the Arctic char begin their annual migration to the sea. This is the period when they are more voracious and more attracted to the fisherman's lure. They remain in the sea, congregating around the mouths of rivers until September when they move back upstream to the spawning and wintering grounds in the lakes.

From break-up to freeze-up, grayling and lake trout swarm in the rivers and lakes.

Non-resident angling licenses cost $2.00.

In 1966, the Department of Indian Affairs and Northern Development established a small tourist camp at Rankin Inlet, to demonstrate the feasibility of tourist development in the area. Subsequently, similar camps were established at Baker Lake and Whale Cove. The camps at Rankin Inlet and Baker Lake are now run by private entrepreneurs.

Yellowknife, capital of the Northwest Territories, boasts the only golf course North of 60, and during July, when the sun never sets 24-hour golfing marathons are a popular sport.

The Great Slave Lake region surrounding Yellowknife is a source of interest to the geologist and rockhound, being rich in Paleozoic fossils and a wide range of rocks and minerals such as beryl, amethyst, garnet, jasper, rose quartz, serpentine and tourmaline.

The Mackenzie River and its tributaries, the Slave, the Nahanni, the Liard and the Peel, provide thousands of miles of navigable water. The Mackenzie, one of the world's largest rivers, has historically been the main water transportation route in the Northwest Territories. Many of the historic settlements of the Territories are scattered along its banks.

The Hudson's Bay Company, which has encouraged tourism in the Territories, from the early days when the firm operated a paddle steamer on the Mackenzie, has kept pace with the times by introducing a U-Paddle canoe rental system North of 60.

For further information write:

Travel Arctic
Yellowknife, NWT.

# north of 60

## transport

northern economic
development branch
department of indian affairs
and northern development
government of canada

## INDEX

## TRANSPORT NORTH OF 60



Revised April, 1971.

TABLE 8-3

COMMERCIAL AIR SERVICES
YUKON TERRITORY

| Point | Carrier | Class of Service |
|---|---|---|
| Clinto Creek | Great Northern Airways Ltd., #3 Hangar, McCall Field, Calgary, Alta. | 3 |
| Dawson | Great Northern Airways Ltd. | 4AB, 9-4, 3, 2 |
| Mayo | Great Northern Airways Ltd.<br>Mayo Helicopters | 4B, 2<br>4(C) |
| Old Crow | Great Northern Airways Ltd. | 3 |
| | Wien Consolidated Airlines Inc. Fairbanks, Alaska | 9-3 |
| Ross River | Terr-Air (Territorial Airways) Ltd. | 4B |
| | Yukon Airways Ltd. Box 179, Whitehorse, Y.T. | 4BC |
| Watson Lake | B.C. Yukon Air Service Ltd., Watson Lake, Y.T. | 4BC, 9-4 |
| | Canadian Pacific Air Lines Ltd. | 1 |
| | Frontier Helicopters Ltd. P.O. Box 10, Watson Lake, Y.T. | 4(BC) |
| | Watson Lake Flying Services Ltd. Watson Lake, Y.T. | 4BC |
| Whitehorse | CP Air Ltd.<br>Globe Air Services Ltd.<br>Great Northern Airways Ltd. | 1, 2, 4A, 9-4<br>4C<br>2, 3, 4BC, 9-4 |
| | Kenting Aircraft Ltd. | 4(C) |
| | Tintina Air Services Ltd.<br>Trans-North Turbo Air Ltd. P.O. Box 1103, Whitehorse, Y.T. | 4, 9-4<br>4(C) 9-4 |
| | Wien Consolidated Airlines Inc. | 8 |
| | Yukon Airways Ltd. | 4, 9-4 |

**TABLE 8-3 continued**

Classification:

Class 1 – Scheduled Air Carriers
Air carriers who offer public transportation of persons, mails and/or goods by aircraft, serving designated points in accordance with a service schedule and at a toll per unit.

Class 2 – Regular Specific Point Air Carriers
Air carriers who offer public transportation of persons, mails and/or goods by aircraft serving designated points on a route pattern and with some degree of regularity, at a toll per unit.

Class 3 – Irregular Specific Point Air carriers
Air carriers who offer public transportation of persons, mails and/or goods by aircraft from a designated base, at a toll per mile or per hour for the charter of the entire aircraft, or at such other tolls as may be permitted.

Class 4 – Charter Air Carriers
Air carriers who offer public transportation of persons and/or goods by aircraft from a designated base, at a toll per mile or per hour for the charter of the entire aircraft, or at such other tolls as may be permitted. Class 4 charter air carriers, using fixed wing aircraft, are divided into three groups:

Group A – Class 4 air carriers who operate one or more aircraft each of which has a maximum authorized take-off weight on wheels in excess of 18,000 pounds.

Group B – Class 4 air carriers who operate one or more aircraft each of which has a maximum authorized take-off weight on wheels in excess of 2,500 pounds but not greater than 18,000 pounds.

Group C – Class 4 air carriers who operate one or more aircraft each of which has a maximum authorized take-off weight on wheels not greater than 2,500 pounds.

Explanation of Abbreviations

| | |
|---|---|
| 1 | Class 1 Scheduled |
| 2 | Class 2 Regular Specific Point |
| 3 | Class 3 Irregular Specific Point |
| 4A | Class 4, Group A, Charter |
| 4B | Class 4, Group B, Charter |
| 4C | Class 4, Group C, Charter |
| 4AB | Class 4, Groups A and B, Charter |
| 4ABC | Class 4, Groups A, B and C, Charter |
| 4BC | Class 4, Groups B and C, Charter |
| 8 | International Scheduled |
| 9-3 | Class 9-3 International Irregular Specific Point |
| 9-4 | Class 9-4 International Non-Scheduled Charter |

# TRANSPORT NORTH OF 60

## 8–1.1 – GENERAL

As the pace of economic development North of 60 accelerates, an economic, efficient transportation system serving the Yukon and the Northwest Territories is being developed by the Federal and Territorial Governments and by private enterprise.

Continuing technological improvements in the various methods of transportation are resulting in greater mobility and lower transport costs.

Physical barriers remain the biggest challenge North of 60. Although areas of the Yukon are no more than 100 miles from Pacific tidewater, the Coast Range Mountains, rising sharply out of the Yukon plateau, seal off the Territory inland.

Several passes through these mountains have provided some links with the Pacific, but the costs of building and maintaining permanent routes through the Coast Range have been formidable.

The great distances of the Northwest Territories, separating the source of resource material from the ultimate destination in southern Canada and overseas, the relatively small volumes of traffic moving into and within the Territories, and the seasonal nature of much of the existing transportation system, all combine to throw up huge obstacles against the speedy development of an efficient service.

The Federal Government, which has jurisdiction over the Yukon and the Northwest Territories, is heavily involved in providing a variety of transport facilities throughout the two regions. On the one hand, it is making direct expenditures in the establishment of the facilities, and on the other, it has a number of programs underway to assist private enterprise in building facilities necessary to the development of resource industries, such as the Northern Roads Network Program and the Northern Resource Airports Program (See Map 8-1)

### 8–1.1.1 – Rail

Each of the Territories is served by a railway line:

The White Pass and Yukon Route runs from Whitehorse, Y.T., 110 miles to Pacific tidewater at Skagway, Alaska.

The Great Slave Lake Railway, runs from Pine Point, on the south shore of Great Slave Lake, 435 miles south to Grimshaw, Alta., where it connects with the continental rail system.

Comparisons of the freight rates between the two rail lines and between those charged in the rest of Canada are not practical, because of the varied types of service and facilities provided. The Great Slave Lake Railway is still under construction and its rates are therefore not under the regulatory jurisdiction of the Railway Committee of the Canadian Transportation Commission. It is understood that concentrates move from Pine Point on the line at a rate of 1.7 cents per ton mile. The White Pass railway is not a system that can be viewed in isolation. It is part of an integrated truck-rail-water container operation which connects the Yukon with the outside world via Vancouver, B.C. and Skagway, Alaska. Most commodities moving on this system do so under through rates which represent the combined costs of operating the various components of the overall system.

### 8–1.1.2 – Roads

Winter roads are an important means of providing transportation North of 60. In the winter months, when temperatures are constantly below freezing point, rights-of-way can be prepared across plains, tundra, muskeg and frozen lakes. The running surface of packed snow and ice can be used by standard haulage equipment, and in this way ore may be carried south and supplies may be built up in the winter for use during the summer months. These winter roads have in most cases been constructed and operated by private contractors, and in several cases have been subsidized by government funds.

Trucking services, linking the Yukon and the southern Mackenzie District of the Northwest Territories with southern Canada, are available on a year-round basis.

Examples of truck transportation rates for various commodities from Edmonton, Alta., to Hay River, N.W.T., via the Mackenzie Highway, calculated on a hundred weight basis:

| | |
|---|---|
| Vegetables | $3.75 |
| Frozen meats | 4.22 |
| Fresh fruits | 3.75 |
| Flour | 3.21 |
| Builder's hardware | 3.37 |
| Roofing materials | 2.52 |

Further information may be obtained from local carriers.

**TABLE 8-1**

**ROAD CONSTRUCTION AND USAGE**
**YUKON AND NORTHWEST TERRITORIES, 1961-70**

| | New Construction | | Total Miles in Use | |
|---|---|---|---|---|
| Year | N.W.T. | Yukon | N.W.T. | Yukon |
| 1961 | 63 | 67 | 748 | 735 |
| 1962 | 56 | 112 | 763 | 847 |
| 1963 | 67 | 65 | 768 | 901 |
| 1964 | 38 | 84 | 721 | 936 |
| 1965 | 23 | 78 | 749 | 969 |
| 1966 | 35 | 32 | 784 | 1,001 |
| 1967 | 145 | 50 | 894 | 1,051 |
| 1968 | 47 | 88 | 941 | 1,139 |
| 1969 | 45 | 84 | 986 | 1,223 |
| 1970 | 64 | 127 | 1,050 | 1,350 |
| 1971 (planned) | 110 | 45 | 1,160 | 1,395 |

NOTE: Although new roads were constructed, some low-class roads were abandoned.

### 8–1.1.3 – Water

Movement of freight by water is a major form of transportation, particularly in the Northwest Territories. The two main water supply systems are:

The Mackenzie River system, originating at Hay River, N.W.T. and McMurray Alta., and Arctic coastal transportation facilities from Tuktoyaktuk, N.W.T.

The sea lift to the eastern Arctic and Arctic Islands undertaken annually by the Department of Transport (see Transport, Northwest Territories, Water)

### 8–1.1.4 – Air

The airplane, which was instrumental in the opening of the Canadian North in the 1920's and 30's, continues to play a dominant role in resource development. Whereas the early bush pilots relied on slow and inefficient aircraft, the North is now serviced by a variety of aircraft suited to a range of particular purposes. These aircraft vary in size from small bush planes, such as the Cessna 180, to giant freighters, such as the Hercules.

Four commercial airlines now provide regularly scheduled passenger and freight service to the Yukon and the Northwest Territories.

Passenger and freight charges are generally higher North of 60 than in the rest of Canada, even on routes which have a relatively high density of traffic. However, with the introduction of faster and more efficient equipment on many northern routes this gap has been narrowed. It may be some time before the gap is closed completely because the costs of supporting any activity North of 60, including air transport, are determined by a variety of factors, and are usually quite high.

Thus passenger fares and freight rates 20 to 50 per cent higher than southern Canada rates may be expected to continue in the Territories for some time to come.

Charter rates vary widely. In the case of multi-engine aircraft the rates compare favourably with those in southern Canada. Rates for DC-3 and other smaller aircraft are generally higher.

The following table indicates typical charter rates in four main communities in the Yukon and the Northwest Territories. (Note: W–Wheels; S–Skis; F–Floats; S/W–Ski/Wheels).


TRANSPORTATION
SCALE OF MILES
100 0 100 200 300
LEGEND
ROADS
RAILROADS
WATER
PIPELINE
Yukon Territory
Dawson
Keno Hill
Carmacks
Ashihill
Ross River
Whitehorse
Tungsten
Fort Simpson
Yellowknife
Hay River
Pine Point
Fort Smith
NORTHWEST TERRITORIES
Arctic Circle
140°
130°
120°
110°
100°
90°
80°
70°
60°

MAP NO. 8–1

## 8–2.1 – YUKON TERRITORY

### 8–2.1.1 – Rail-Water

When the great Klondike gold rush focused world attention on the Yukon in 1898 the horde of fortune seekers came by steamer up the Pacific Coast of British Columbia to the Alaska Panhandle. Standing between them and the golden treasure which they sought were the forbidding Coast Range mountains. The principal routes through these mountains, and the routes which most of the gold seekers followed, were by way of the White and Chilkoot Passes.

The White Pass route remains the principal means of access from tidewater to the Yukon interior today. Since the early 1900's passengers and freight have moved over the 110-mile White Pass and Yukon Route between Whitehorse and Skagway, Alaska, on the Lynn Canal. The narrow gauge railway is one of the most spectacular in the world. During its first 20 miles from Skagway it climbs in a series of twists and turns from sea level to an altitude of about 3,000 feet.

The railway's freight service is linked with a dry cargo and bulk petroleum transport ship which operates between Skagway and Vancouver. Modernization of the rail-water system has taken place and the introduction of container service has resulted in lower freight costs.

In addition to the rail-water operations the White Pass and Yukon also operates two trucking fleets, one within the Yukon and the other on the Alaska highway as well as a pipeline which runs parallel to the railroad. The pipeline has a maximum capacity of 3,000 barrels of petroleum products per day.

The White Pass and Yukon railway also provides passenger service, particularly for the large volume of tourists arriving at Skagway by coastal vessel. During the gold rush, and for several decades thereafter, water transportation was the principal means of transport used by long-distance travellers and freight handlers within the Yukon. Fleets of sternwheelers regularly sailed the Yukon River between Whitehorse, Dawson and Mayo Landing, but during the 1950's motorized road transport moving over the rapidly growing network of highways replaced the river system, except for small local services.

Further information on the White Pass and Yukon Route may be obtained from:

White Pass & Yukon Corporation,
12th Floor Standard Bldg.,
510 West Hastings Street,
Vancouver 2, B.C.
Telephone 683-7221
Telex 045-613

### 8–2.1.2 – Roads

Construction of the Alaska Highway during World War II gave the Yukon access by road to the rest of Canada, and to Alaska. The highway begins officially at Dawson Creek, B.C., and ends at Fairbanks, Alaska, a distance of 1,523 miles of which 1,220 are in Canada.

The highway crosses the southern part of the Yukon and provides an essential surface link for the vast developing area of the Territory.

Along its length such communities as Fort St. John, Fort Nelson, Watson Lake, Whitehorse and Haines Junction, rely on the highway for transport and communication.

The Alaska Highway has not thus far proven an economic route for the transport of most Yukon mineral products.

Another road of importance to the Yukon and also to the State of Alaska is the 160-mile gravel road which joins the Alaska Highway, at Haines, Alaska, on the Lynn Canal. The all-weather road is the only land link between the Alaska Panhandle and mainland Alaska. An excellent ferry system, operated by the State of Alaska, connects Haines with prince Rupert, B.C., which is the terminus of the highway system linking northern British Columbia and the entire North American continent. The ferry system and the Haines road comprise a popular tourist route which draws many visitors during the summer months, and which can also be used during the winter, although the motorist should be warned that adequate preparation should be taken if a winter trip on the Haines road is contemplated.

In 1965 the Federal Government initiated a new Northern Roads Program which calls for an annual expenditure of $10,000,000 for ten years. The objective is to establish a network of roads which would serve forseeable development and communications needs in both the Yukon and the Northwest Territories. The type of road construction varies from rough trails and seasonal roads, both summer and winter, to gravel highways.

One major area development road built by the Federal Government is the new 129-mile, $9,300,000 Ross River – Carmacks road servicing the new Anvil Mining Corporation lead-zinc mine near Ross River. The road is built to carry up to 90,000 pound loads, compared to most territorial roads which are designed to carry loads up to 75,000 pounds.

In November, 1970, the Federal Government announced a program to speed up construction of the Dempster Highway, through the northern Yukon to Fort McPherson and a connecting link to Arctic Red River and Inuvik in the Northwest Territories.

The Dempster Highway runs northeast from the Dawson area in the Yukon, which is already linked to southern Canada by the Alaska Highway. The new construction will extend the road 240 miles through Fort McPherson and Arctic Red River, and finally Inuvik, in the Mackenzie River delta. A further short leg planned from Inuvik to Tuktoyaktuk would result in the first all-Canadian road leading to the Arctic Ocean. When completed in 1974, the new highway will give Canadians their first road access to the Arctic.

### 8–2.1.3 – Air

The Yukon Territory is linked to the continental airline system through regularly scheduled passenger and freight services provided by CP Air, from Edmonton and Vancouver. Service between Whitehorse and Fairbanks, Alaska, is provided by Wien Consolidated Airlines. Juneau, the capital of Alaska, and Whitehorse, the Yukon capital, are also connected by regular air services.

The Federal Department of Transport and the Yukon Government operate the major airports in the Yukon. Scheduled and chartered air services are maintained by various companies.

There are 7 licensed and 12 unlicensed airports in the Yukon as well as 5 licensed and 6 unlicensed seaplane bases.

## 8–3.1 – NORTHWEST TERRITORIES

### 8–3.1.1 – Rail

The Mackenzie District of the Northwest Territories is linked by rail to the rest of Canada and the continental rail system by the Great Slave Lake Railway. The 435-mile line was built by the Federal Government at a cost of some $80,000,000 and began operating in 1964, two years ahead of schedule. Although it has been operating for some years the railway is still under construction and has not, as yet, been designated a common carrier for rate making and operative purposes.

The rail line was constructed primarily to transport ore and concentrates from the Pine Point Mines Ltd. vast lead-zinc operations on the south shore of Great Slave Lake to smelters in Trail, B.C.

In addition, the railway carries considerable freight, such as petroleum products, mine and mill supplies, foodstuffs and general merchandise for Pine Point and the northern Alberta region generally.

On the return trip, trains are also hauling agricultural and forest products from the area.

The rail line has proved a spectacular success. Production at Pine Point has exceeded expectations, and total traffic on the railway has increased substantially from the initial figure of about 8,000 carloads per year.

Along the rail line new farmland has been cleared, communities north of the Peace River are growing rapidly, and oil exploration and development firms operating in the new Rainbow Lake oilfields in northwestern Alberta are making increasing use of the railway facilities.

Additional information on the railway may be obtained from:

Great Slave Lake Railway,
Canadian National Railways,
Edmonton, Alberta.
Phone (403) 429-8110

### 8–3.1.2 – Water

Water transport, used initially by the first adventurers in the Canadian North, remains a major form of transportation in the Northwest Territories.

The major carrier on the Mackenzie River System and along the Western Arctic Coast is the Northern Transportation Company Limited, a Crown-owned Company, serving a 4,000 mile water system connected by road and rail terminals at Waterways, Alberta, and Hay River, in the Northwest Territories. The Company also maintains distribution agencies at Bushell, Saskatchewan and, in the Northwest Territories at Norman Wells, Inuvik, Bear River and Tuktoyaktuk.

The company operates 27 modern diesel tugs equipped with two-way radios, radar and echo sounders, two coasting vessels and 142 all-steel barges suitable for handling dry or bulk cargo. Barges have a capacity varying from 70 to 1,500 tons.

Present facilities are capable of handling, in one short summer season, up to 450,000 tons of dry and bulk cargo.

The shipping season is from early May to late September, depending on area and ice conditions. Receiving warehouses are open in April.

The Northern Transportation Company Limited is now playing a major role in supplying oil exploration teams operating along the Western Arctic Coast, including Alaska, and in the Mackenzie Delta. The Prudhoe Bay area on the North Slopes of Alaska, where a large oil discovery has been made, is receiving part of its supplies by way of this route.

Sample freight rates from Hay River are given below:

| | |
|---|---|
| Hay River to Prudhoe Bay | $4.40 per 100 lbs. |
| Hay River to Inuvik | $2.00 per 100 lbs. |
| Hay River to Tuktoyaktuk | $2.25 per 100 lbs. |

Fifth Class rates for General Commodity goods on the Mackenzie System are structured between 4¢ to 5¢ per ton mile for deck cargo and approximately 3½¢ per ton mile for bulk oil, exception being made for certain arbitraries in the Bear River and Great Slave Lake areas.

Distances, in miles, from Hay River to points along the Mackenzie System are as follows:

| | |
|---|---|
| Fort Good Hope | 711 |
| Arctic Red River | 925 |
| Fort McPherson | 980 |
| Aklavik | 1,025 |
| Reindeer Station | 1,033 |
| Inuvik | 1,042 |
| Tuktoyaktuk | 1,122 |

Acceptance of Freight

All shipments are received subject to the rules and terms of current published tariffs and Shipping Receipt of the Company, which can be seeen at the company's offices at 10040-105 Street, Edmonton, Alberta; Hay River, N.W.T. and Waterways, Alberta.

Storage:

Freight is stored free of charge while awaiting shipment, but at the owner's risk for fire, floor or frost damages.

Railway, truck charges:

All railway, truck and other transportation charges must be paid at Hay River, N.W.T. or Waterways, Alberta. Shippers must advise the receiving terminals if shipments are "Prepaid to Destination".

C.O.D. Shipments:

With the exception of refrigerated products the Company will carry C.O.D. shipments provided they are delivered to the Company, all charges prepaid (not including the Company's own charges). The Company must be advised in writing, prior to the receipt of the shipment, the amount of C.O.D.

Bulk Oil Movement:

Space for bulk oil shipments is available on tows leaving Hay River, N.W.T., Norman Wells, N.W.T., and Waterways, Alberta.

Insurance:

Shippers are advised to insure shipments. Cargo insurance may be obtained upon application to the Company.

| | |
|---|---|
| Packing, Crating: | All cases, crates or containers should be of strong construction, and contents well packed, otherwise cargo will be carried at owner's risk. The shipper will be considered the owner until cargo is delivered to the consignee. |
| Marking: | Packages should be clearly marked with numbers on the left and weights on the right, and should be individually marked. |
| Weights: | All weights must be accurate gross weights, and not approximated. |
| Refrigeration: | Refrigerated service, consisting of three trips per season, is provided along the Mackenzie River from Hay River, N.W.T. to Tuktoyaktuk, N.W.T. for vegetables, fresh fruits and frozen meats. Shippers must reserve space well in advance of sailing dates. |

For further details and complete information contact:

Northern Transportation Company Limited,
General Office,
10040 - 105 Street,
Edmonton Alberta.

Telephone: (403) 422-2161

Telex: 037-2480

The Federal Department of Transport is the co-ordinator of freight moving into the eastern Arctic and the Archipelago. Through the Canadian Coast Guard the Department organizes and operates annual sea-lifts.

Dry cargo rates per ton-mile vary according to latitude. Those for destinations lying north of approximately the 70th parallel are higher than rates to more southerly points. For more southerly destinations, such as Carol Harbour, Baker Lake and Repulse Bay, rates tend to be in the vicinity of 3-4 cents per ton mile. For points further north, such as Resolute Bay and Grise Fiord, rates tend to be in the vicinity of 5 cents per ton mile.

For further information write:

Marine Services Division,
Department of Transport,
Hunter Building,
Ottawa, Ontario.

In addition to Northern Transportation Company four licensed private carriers operate on the Mackenzie River. They are as follows:

**Kaps Transport Limited, Edmonton, Alta.**

Licence CTC (WT–23) 2 Tugs, 6 Barges

Licence to transport goods on the Mackenzie watershed to any point adjacent and/or accessible to, exploration drilling sites, pipeline rights of way, building and construction sites; including the movement of goods off the Mackenzie and up other routes which would be navigable, such as the Liard and other rivers.

Licence CTC (WT–29) 2 Tugs, 8 Barges

Licence to transport goods by water from ports and places on the Mackenzie River as defined in the Transport Act, that is, all rivers, streams, lakes and other waters within the watershed of the Mackenzie River.

**Streeper Brothers Marine Transport Ltd., Dawson Creek, B.C.**

Licence CTC (WT–22) 1 Tug, 3 Barges

Licence to transport goods by water from ports and places on the Fort Nelson and Liard Rivers to ports and places on the Mackenzie and from the Mackenzie River to the Liard and Fort Nelson Rivers.

Licence CTC (WT–28) 1 Tug, 2 Barges

Licence to transport goods by water from ports and places on the Mackenzie and from the Mackenzie River to Liard and Fort Nelson Rivers.

**Cooper Barging Services Ltd., Fort Nelson, B.C.**

Licence CTC (WT–31) 2 Tugs, 4 Barges

Licence to transport goods by water between all ports and places within the watershed of the Mackenzie River.

**Lindberg Transport Limited, Fort Simpson, N.W.T.**

Licence CTC (WT–32) 1 Tug, 1 Barge

Licence to provide a weekly barge service to transport goods by water from ports and places on the Mackenzie River watershed between Fort Providence, Northwest Territories and Fort Simpson, Northwest Territories.

**8–3.1.3 – Roads**

The existing highway system in the Northwest Territories is confined mainly to the southern region, around Great Slave Lake. However, winter roads are becoming an increasingly efficient means of moving supplies into position for the next season's program of exploration and development, and of moving ores and concentrates south to market. For winter roads, the initial cost of opening the road usually varies between $300 and $500 per mile, although in some cases they have been much higher in areas of unfavorable terrain. Maintenance costs range from $200 to $500 per mile per year. Actual haulage costs vary greatly, depending on traffic and the type of equipment and supplies hauled, and the location of the road.

The Mackenzie Highway, running 600 miles from Grimshaw, Alberta, north to Hay River and Yellowknife, N.W.T., is at present the only highway link between the Northwest Territories and the southern regions of Canada.

A $10,700,000 extension of the Mackenzie Highway running 95 miles northwest to Fort Simpson, marks the beginning of what may eventually be a permanent highway down the Mackenzie River Valley to the Arctic Coast.

A smaller road system in the Fort Smith area covers approximately 274 miles, including administrative roads in Wood Buffalo National Park.

Trucking rates along the Mackenzie Highway are slightly higher than those in the neighboring province of Alberta.

**8–3.1.4 – Air**

The Northwest Territories are currently served by three commercial airlines connected to the south.

Pacific Western Airlines flies from Edmonton to Fort Smith, Yellowknife, Inuvik, Cambridge Bay, Norman Wells, Wrigley, Resolution.

Transair operates from Winnipeg to Churchill, Manitoba and points in the Eastern Arctic.

Nordair flies from Montreal to Cape Dyer, Frobisher Bay, Fort Chimo and Resolute Bay.

Charter air carriers, designated by the Air Transport Committee of the Canadian Transport Commission as Class 4 air carriers, operate throughout the Northwest Territories.

Group C — Class 4 air carriers who operate one or more aircraft each of which has a maximum authorized take-off weight on wheels not greater than 2,500 pounds.

Explanation of Abbreviations

| | |
|---|---|
| 1 | Class 1 Scheduled |
| 2 | Class 2 Regular Specific Point |
| 3 | Class 3 Irregular Specific Point |
| 4A | Class 4, Group A, Charter |
| 4B | Class 4, Group B, Charter |
| 4C | Class 4, Group C, Charter |
| 4AB | Class 4, Groups A and B, Charter |
| 4ABC | Class 4, Groups, A, B and C, Charter |
| 4BC | Class 4, Groups B and C, Charter |
| 8 | International Schedule |
| 9-3 | Class 9-3 International Irregular Specific Point |
| 9-4 | Class 9-4 International Non-Scheduled Charter |

MAP NO. 8–2


AIR TRANSPORTATION ROUTES
SCALE OF MILES
LEGEND
PACIFIC WESTERN
CANADIAN PACIFIC AIRLINES
TRANSAIR
NORDAIR
Resolute
Clyde River
Broughton I.
Cape Dyer
Inuvik
Igloolik
Hall Beach
Cambridge Bay
Dawson
Mayo
Norman Wells
Repulse Bay
Frobisher Bay
Whitehorse
Wrigley
Cape Dorset
Baker Lake
Coral Harbour
Watson Lake
Fort Simpson
Yellowknife
Chesterfield Inlet
Rankin Inlet
Fort Resolution
Hay River
Whale Cove
Fort Smith
Eskimo Point

TABLE 8-2

AIR CHARTER RATES NORTH OF 60

**Frobisher N.W.T.**

| Carrier | Aircraft | Rate Per Mile | Rate Per Hour |
|---|---|---|---|
| | | (dollars) | |
| Nordair Ltd. Hangar No. 6, Montreal Airport Dorval, P.Q. | DC3 (W) | 1.80 | 241.20 |
| | DC3 (S/W) | 1.90 | 255.00 |
| Wheeler Northland Airways Ltd., P.O. Box 217, St. Jean, P.Q. | Piper Aztec (W) | 1.25 | 220.00 |
| | DHC-3-Otter (W/S/F) | 1.55–1.75 | 155.00–175.00 |
| | Otter (A) | 2.10 | 210.00 |
| | Otter (low pressure tires) | 1.75 | 175.00 |
| | Dornier DO-28B-1 (W/S/F) | 1.15 | 150.00 |
| **Whitehorse, Y.T.** | | | |
| CP Air, 1281 W. Georgia St., Vancouver 5, B.C. | B737 (W) | 2.25 | 1,400.00 |
| Globe Air Services Ltd. P.O. Box 1125, Whitehorse, Y.T. | Cessna 172 (W) | .45 | 55.00 |
| | Cessna 150 (W) | .30 | 30.00 |
| | Cessna 185 (W) | .60 | 80.00 |
| | Cessna 185 (F) | .65 | 80.00 |
| | Piper Comanche PA24.250 (W) | .55 | 90.00 |
| | Cessna 180 (W/S/F) | .60–.70 | 70.00–80.00 |
| | Cessna U206 (W/S) | .65 | 100.00 |
| Great Northern Airways Ltd., No. 3 Hangar, McCall Field, Calgary 67, Alta. | Beaver (W/S/F) | .90–1.10 | 95.00–110.00 |
| | PA23-250 Aztec | .70–.75 | 140.00–145.00 |
| | PA31-Navajo (W) | .80–1.00 | 165.00–200.00 |
| | Fairchild F27J | 1.75 | 460.00 |
| | Douglas DC3 (W) | 1.50–1.60 | 225.00–240.00 |
| | Douglas DC3 (S) | 1.90–2.15 | 285.00–323.00 |
| | Douglas DC4 | 2.20 | 396.00 |
| | Otter | 1.30–1.60 | 140.00–175.00 |
| | Twin Otter (W) | 1.50–2.10 | 250.00–350.00 |
| Tintina Air Services Ltd., 954 Second Ave., Whitehorse, Y.T. | Piper Cherokee 140 | .36 | 40.00 |
| | Piper Cherokee 180 | .50–.55 | 60.00–65.00 |
| | Cessna 180 | .60–.70 | 70.00–80.00 |
| | Cessna 206 | .70–.75 | 105.00–110.00 |
| | Cessna 185 | .70–.90 | 80.00–100.00 |
| | Champion 79C | .35 | 35.00 |
| Yukon Airways Ltd., P.O. Box 179, Whitehorse, Y.T. | Cessna 185 (W/F/S) | .70–.90 | 95.00–105.00 |
| | Cessna 320D (W) | .75–.85 | 150.00–170.00 |
| | Beaver (W/S/F) | .90–1.10 | 95.00–110.00 |
| | PA23-250 (W) | .70–.75 | 140.00–150.00 |
| | Cessna 402A (W) | .90–1.00 | 180.00–200.00 |
| | Britten-Norman Islander (W) | 1.00–1.20 | 140.00–160.00 |

Rates and availability of aircraft may vary according to season and zone.

Yellowknife, NWT.

| Carrier | Aircraft | Rate Per Mile (dollars) | Rate Per Hour (dollars) |
|---|---|---|---|
| Gateway Aviation Ltd., No. 13 Hangar-Industrial Airport, Edmonton, Alta. | Cessna 150 (W) | .24 | 24.00 |
| | Cessna 172 (W) | .42 | 45.00 |
| | Cessna 310 (W) | .70–.75 | 140.00–150.00 |
| | Cessna 180 (W) | .50–.60 | 55.00–65.00 |
| | Cessna 180 (S/F) | .55–65 | 60.00–70.00 |
| | Cessna U206 (S) | .65–80 | 80.00–95.00 |
| | Cessna U206 (S/F) | .65–.75 | 78.00–90.00 |
| | Beaver (W/F/S) | .80–1.10 | 80.00–110.00 |
| | Otter (W/F/S) | 1.20–1.50 | 120.00–150.00 |
| | Twin Otter (W/F/S) | 1.40–2.00 | 240.00–320.00 |
| | Beechcraft D18S (W) | .90–1.00 | 140.00–150.00 |
| | Beechcraft D18S (F) | 1.05–1.20 | 140.00–160.00 |
| | Twin Beech Bonanza C50 (W) | .60–.65 | 110.00–120.00 |
| | Douglas | 1.50–1.60 | 225.00–240.00 |
| Koenen's Air Service Ltd., P.O. Box 223, Yellowknife, N.W.T. | Cessna 185 (W/F/S) | .60 | 75.00 |
| Northward Aviation Ltd., 10350-124 St., Edmonton, Alta. | Beaver | .90–1.10 | 95.00–110.00 |
| | Beech D18S (W) | .90–1.00 | 140.00–160.00 |
| | Beech D18S (F) | 1.05–1.20 | 140.00–160.00 |
| | Beech D18S (W/F) | 1.05–120 | 140.00–160.00 |
| | Cessna 402A | .90–1.00 | 180.00–200.00 |
| | Cessna 206 | .65–.75 | 80.00–90.00 |
| | Helio Courier H250 | .55–.85 | 65.00–100.00 |
| | Dornier DO28 | .90–1.20 | 117.00–156.00 |
| | Otter | 1.35–1.60 | 145.00–175.00 |
| | Twin Otter | 1.50–2.10 | 250.00–350.00 |
| Northwest Territorial Airways Ltd., P.O. Box 100, Yellowknife, N.W.T. | DC-3 (W) | 1.65 | 240.00 |
| | DC-3 (W/S) | 1.90 | 265.00 |
| | Otter (W/S/F) | 1.20–1.45 | 120.00–145.00 |
| | Super Beech 18 (W) | 1.00–1.10 | 150.00–160.00 |
| | Super Beech 18 (W/S) | 1.20–1.30 | 150.00–160.00 |
| | Super Beech 18 (F) | 1.20–1.30 | 150.00–160.00 |
| | Cessna 180 (W/F/S) | .60–.65 | 60.00–70.00 |
| | PA23-250 Aztec (W) | .75 | 130.00 |
| Pacific Western Airlines Ltd., Vancouver Airport, B.C. | Boeing 737 (W) | 3.10 | 1400.00 |
| | Boeing 707-138B | 4.05 | 2000.00 |
| | Convair 640 (W) | 1.75 | 420.00 |
| | DC3 (W) | 1.50 | 225.00 |
| | DC4 (W) | 2.20 | 396.00 |
| | DC6 | 2.65 | 636.00 |
| | DC6B (W) | 2.85 | 684.00 |
| | Lockheed Hercules L100-20 | 4.00–4.50 | 1275.00 |

Rates and availability of aircraft may vary according to season and zone.

Yellowknife, NWT (cont.)

| Carrier | Aircraft | Rate Per Mile (dollars) | Rate Per Hour (dollars) |
|---|---|---|---|
| Ptarmigan Airways Ltd., Box 66, Yellowknife, N.W.T. | Cessna 180 (W/F/S) | .55–.70 | 60.00–84.00 |
| | Stinson SH9F (F/S) | .75–.90 | 83.00–99.00 |
| | Piper Aztec (W) | .65–.75 | 120.00–130.00 |
| | Cessna 185 (W/SF) | .60–.75 | 75.00–95.00 |
| Sioux Narrows Airways Ltd., Airport Hotel, Winnipeg, Man. | Gruman G-21A (A) | 1.00 | 125.00 |
| | Beechcraft D18 (W/F) | 1.35 | 125.00 |
| | Piper Aztec (W/F) | .75 | 112.00 |
| | Norseman | 1.00 | 125.00 |
| Wardair Canada Ltd., 26th Floor-CN Tower, Edmonton, Alta. | Otter | 1.30–1.60 | 140.00–175.00 |
| | Bristol 170 | 2.15–2.30 | 345.00–370.00 |
| | Piper PA 230-160 (W) | .50–.65 | 75.00–97.00 |
| | Twin Otter (W/S/F) | 1.50–2.10 | 250.00–350.00 |
| **Inuvik, N.W.T.** | | | |
| Aklavik Flying Service Ltd. P.O. Box 1452, Inuvik, N.W.T. | Cessna 185 (W/S/F) | .55–75 | 75.00–95.00 |
| | Beech C45W (W) | .80 | 129.00 |
| Great Northern Airways Ltd., No. 3 Hangar, McCall Field, Calgary 67, Alta. | same as that shown under Whitehorse, Y.T. | | |
| Northward Aviation Ltd., 10350-124 Street, Edmonton, Alta. | same as that shown under Yellowknife, N.W.T. | | |
| Reindeer Air Service Ltd. P.O. Box 1068, Inuvik, N.W.T. | Beech D18S "900" (W) | .90–1.10 | 145.00–175.00 |
| | Beech D18S "900" (F/S) | 1.05–1.20 | 145.00–175.00 |
| | Beech B50 (W) | .75–.95 | 175.00–200.00 |
| | Cessna 180"225" (W/F/S) | .55–.65 | 66.00–80.00 |
| | Cessna 185 "260" | .65–.75 | 85.00–103.00 |
| | Cessna 185"300" STOL | .70–.80 | 90.00–110.00 |
| | Cessna 195 | .60–.70 | 72.00–90.00 |
| | Piper Aztec "B" (W) | .70–.80 | 165.00–195.00 |
| | Piper Super Cub (W) | .50–.60 | 50.00–60.00 |
| | Twin Navion (W) | .65–.75 | 130.00–160.00 |
| | DC3- (W) | 1.60–1.95 | 240.00–290.00 |

Rates and availability of aircraft may vary according to season and zone.

TABLE 8-4

COMMERCIAL AIR SERVICES
NORTHWEST TERRITORIES

| Point | Carrier | Class of Service |
|---|---|---|
| Aklavik | Northward Aviation Ltd.,<br>#8 Hangar,<br>Edmonton Industrial Airport,<br>Edmonton, Alta. | 2 |
| Arctic Bay | Atlas Aviation Ltd.<br>Resolute Bay, N.W.T. | 3 |
| Arctic Red River | Northward Aviation Ltd. | 2 |
| Baker Lake | Transair Ltd.,<br>International Airport,<br>Winnipeg, Man. | 2 |
| Broughton Island | Nordair Ltd.<br>#6 Hangar,<br>Montreal Airport,<br>Dorval, P.Q. | 3 |
| Cambridge Bay | Northward Aviation Ltd. | 3, 4AB |
| | Northwest Territorial Airways Ltd.<br>P.O. Box 100,<br>Yellowknife, N.W.T. | 3 |
| | Pacific WesternAirlines Ltd.,<br>Vancouver Airport,<br>Vancouver, B.C. | 2 |
| Cameron Bay | Cameron Bay Air Services Ltd.,<br>3rd Floor, Guaranty Trust Bldg.,<br>Edmonton, Alta. | 4B |
| Cape Dorset | Austin Airways Ltd.,<br>Toronto Island Airport,<br>Toronto, Ont. | 2 |
| | Nordair Ltd. | 3 |
| Cape Dyer | Nordair Ltd. | 2 |
| Chesterfield Inlet | Transair Ltd. | 3 |
| Clyde River | Nordair Ltd. | 3 |
| Coppermine | Northward Aviation Ltd. | 3 |
| | Northwest Territorial Airways Ltd. | 3 |
| Coral Harbour | Nordair Ltd. | 3 |
| | Transair Ltd. | 2, 3 |
| Cullaton Lake | Transair Ltd. | 3 |
| Eskimo Point | Transair Ltd. | 3 |
| Eureka | Atlas Aviation Ltd. | 3 |

| Point | Carrier | Class of Service |
|---|---|---|
| Fort Franklin | Northward Aviation Ltd. | 2 |
| | Nakanni Air Services Ltd. | 4B |
| | Reindeer Air Service Ltd. | 3 |
| Fort Good Hope | Northward Aviation Ltd. | 2 |
| Fort McPherson | Arctic Air Ltd. | 3 |
| | Northward Aviation Ltd. | 2 |
| Fort Norman | Northwest Aviation Ltd. | 2 |
| | Reindeer Air Service | 3 |
| Fort Simpson | Arctic Air Ltd.<br>Fort Simpson, N.W.T. | 3, 4B |
| | Pacific Western Airlines Ltd. | 1 |
| Fort Smith | Buffalo Airways Ltd.<br>Fort Smith, Y.T. | 4B |
| | Gateway Aviation Ltd.<br>#12 Hangar, Municipal Airport,<br>Edmonton, Alta. | 4B |
| | Kenting Aircraft Ltd.<br>#1 Hangar, McCall Field,<br>Calgary, Alta. | 4(C) |
| | Pacific Western Airlines Ltd. | 1, 2 |
| Frobisher | Nordair Ltd. | 2, 3, 4A |
| | Wheeler-Northland Airways Ltd.<br>P.O. Box 217,<br>St. Jean, P.Q. | 3, 4B |
| Gjoa Haven | Northward Aviation Ltd. | 3 |
| Grise Fiord | Atlas Aviation Ltd. | 3 |
| Hall Beach | Aviation Development Consultants<br>Nordair Ltd. | 4B |
| | Transair Ltd. | 3 |
| Hay River | Carter Air Service,<br>P.O. Box 128<br>Hay River, N.W.T. | 4B |
| | McKenzie Air Ltd.<br>#9 Hangar, Industrial Airport,<br>Edmonton, Alta. | 4BC |
| | Pacific Western Airlines Ltd. | 1 |
| Holman Island | Northward Aviation Ltd. | 3 |
| | Northwest Territorial Airways Ltd. | 3 |
| Hope Lake | Northwest Territorial Airways Ltd. | 3 |
| | Pacific Western Airlines Ltd. | 2 |
| Igloolik | Nordair Ltd. | 3 |

| Point | Carrier | Class of Service |
|---|---|---|
| Inuvik | Aklavik Flying Service Ltd. | 4B |
| | Great Northern Airways Ltd.<br>#3 Hangar, McCall Field,<br>Calgary 67, Alta. | 2, 4AB |
| | Northward Aviation Ltd. | 2, 4B, 9-4 |
| | Pacific Western Airline Ltd. | 1 |
| | Reindeer Air Service Ltd.<br>Reindeer Station, N.W.T. | 3, 4ABC |
| Isachsen, NWT | Atlas Aviation Ltd. | 3 |
| Lady Franklin | Northwest Territorial Airways Ltd. | 3 |
| Lake Harbour | Wheeler-Northland Airways Ltd. | 3 |
| Melville Island | Atlas Aviation Ltd. | 3 |
| | Northwest Territorial Airways Ltd. | 3 |
| | Pacific Western Airlines Ltd. | 3 |
| Mould Bay | Atlas Aviation Ltd. | 3 |
| Norman Wells | Northward Aviation Ltd. | 2, 4B |
| | Pacific Western Airlines Ltd. | 1 |
| Nueltin Lake | Transair Ltd. | 3 |
| Pangnirtung, | Nordair Ltd. | 3 |
| Pond Inlet | Atlas Aviation | 3 |
| Port Radium | Northwest Territorial Airways Ltd. | 3 |
| Rankin Inlet | Transair Ltd. | 3 |
| Repulse Bay | Transair Ltd. | 3 |
| Resolute | Pacific Western Airlines Ltd. | 2 |
| Resolute Bay | Atlas Aviation | 3, 4BC |
| | Nordair Ltd. | 2 |
| Resolution | Pacific Western Airlines Ltd. | 1 |
| Sachs Harbour | Great Northern Airways Ltd. | 3 |
| Sawmill Bay | Minto Airways Ltd.<br>3rd Floor, Guaranty Trust Bldg.,<br>Edmonton, Alta. | 4B |
| | Northwest Territorial Airways Ltd. | 3 |
| Spence Bay | Northward Aviation Ltd. | 3 |
| Tavani | Transair Ltd. | 3 |
| Tuktoyaktuk | Great Northern Airways Ltd. | 3 |
| | Northward Aviation Ltd. | 2 |
| | Reindeer Air Service Ltd. | 4B |
| Wrigley | Pacific Western Airlines | 1 |

| | | |
|---|---|---|
| Yellowknife | Gateway Aviation Ltd. | 4B |
| | Koenen's Air Service<br>c/o Merrick & Co.,<br>Yellowknife, N.W.T. | 4B, 9-4 |
| | Northward Aviation Ltd. | 3, 4B |
| | Northwest Territorial Airways Ltd. | 3, 4AB, 9-4 |
| | Pacific Western Airlines Ltd. | 1, 2, 4A |
| | Ptarmigan Airways Ltd.<br>c/o Mark M. de Weerdt,<br>Yellowknife, N.W.T. | 4BC |
| | Reindeer Air Service Ltd. | 3 |
| | Sioux Narrows Airways<br>Airport Hotel,<br>Winnipeg, Man. | 4B |
| | Transair Ltd. | 3 |
| | Wardair Canada Ltd.<br>Macdonald Hotel,<br>Edmonton, Alta. | 4AB |

Classification:

Class 1 – Scheduled Air Carriers
Air carriers who offer public transportation of persons, mails, and/or goods by aircraft, serving designated points in accordance with a service schedule and at a toll per unit.

Class 2 – Regular Specific Point Air Carriers
Air carriers who offer public transportation of persons, mails and/or goods by aircraft serving designated points on a route pattern with some degree of regularity, at a toll per unit.

Class 3 – Irregular Specific Point Air Carriers
Air carriers who offer public transportation of persons, mails and/or goods by aircraft from a designated base, at a toll per mile or per hour for the charter of the entire aircraft, or at such other tolls as may be permitted.

Class 4 – Charter Air Carriers
Air carriers who offer public transportation of persons and/or goods by aircraft from a designated base, at a toll per mile or per hour for the charter of the entire aircraft, or at such other tolls as may be permitted. Class 4 charter air carriers, using fixed wing aircraft, and divided into three groups:

Group A – Class 4 air carriers who operate one or more aircraft each of which has a maximum authorized take-off weight on wheels in excess of 18,000 pounds.

Group B – Class 4 air carriers who operate one or more aircraft each of which has a maximum authorized take-off weight on wheels in excess of 2,500 pounds but no greater than 18,000 pounds.

# north of 60 data

northern economic
development branch
department of indian affairs
and northern development
government of canada

## INDEX
DATA

9. a) people

b) goods and services

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## INDEX

## PEOPLE "A"

# PEOPLE

## 9A–1.1 – GENERAL

The human resources is the key to the successful development of all the natural resources North of 60. Like the other resources, the human resource has barely been developed. The Federal Government, through the Department of Indian Affairs and Northern Development, and other departments and agencies, considers the full participation of the indigenous peoples in the economic life of the Territories a main objective in the development of the northern regions.

The percentages of wage earners and experienced workers in the potential labour force of the Territories is significantly lower for the indigenous people than for the other ethnic groups, but in recent years, with the development of new education facilities and employment opportunities, these percentages are increasing.

A recent study of the labour force in the Territorial mining industry indicated that indigenes comprise only 4.5 per cent of the total work force – in contrast to the fact that, according to the 1961 Census, indigenes comprise 45.3 per cent of the Territorial population. The proportion of indigenes in the work force of other Territorial industries is also known to be relatively low. The reasons for the lower labour force participation rates of indigenes cannot be simply stated but certain problem areas can be discerned. Probably the most important of these interrelated areas are:

a) the educational background of the indigenous population;

b) the labour force requirements and attitudes of the industry involved;

c) the social problems of indigenes when they are placed in an industrially-oriented community; and

d) housing.

An added important factor affecting the labour force generally is the movement of persons within the Territories. The economic and sociological climate has in the past resulted in sudden changes in the way of life of the indigenes. However, as the economy and the sociological environment becomes more stabilized, with the development of industry, permanent housing and community amenities, the participation of indigenes in the labour force will show a positive change.

### 9A–1.1.1 – Education

There is an unfortunate tendency to classify all indigenes as uneducated and unskilled. However, in education and skill characteristics, indigenous people of the Territories are *not* a homogeneous group. In general, older indifenes possess relatively low levels of education and skill, but relatively good work records, whereas many indigenes in the younger age groups (particularly those under 25) possess average or above, levels of education and skill. In recent years basic and vocational educational opportunities have become more widely available to Territorial residents and there are clear indications that more indigenes are taking advantage of these opportunities. The participation of all Territorial residents in basic education has markedly increased during the last ten years, and it is estimated that at present at least 93 per cent of Territorial school age children are attending school. In addition to basic education, prevocational and vocational training centres for Territorial residents are located at Whitehorse, Yellowknife, and Fort Churchill, Man. Programs have also been instituted whereby qualified Territorial residents

may continue, or upgrade, their education in provincial institutions (vocational schools, technological institutes and universities) when the training required is not available in the Territories.

To assist adults whose lack of academic training in their early years has inhibited their chances of successful employment, occupational training, occupational certification, apprenticeship, language and upgrading programs, are being offered in several northern areas such as Yellowknife, Fort Churchill, Hay River, Fort Smith and Inuvik. In sone of these programs, students spend half their school day in on-the-job training and the other half in accelerated upgrading programs. Again, if suitable courses are not available in the Territories, arrangements are made for training to be undertaken in the provinces.

This range of education programs has been very well accepted by industrial and governmental employers, and demand for program graduates has exceeded the available supply. Thus it seems very likely that the young indigenous population is becoming a significant potential source of labour for industries in the Territories and other parts of Canada. For "older" indigenes (this group includes relatively uneducated indigenes between 20 and 30 years of age), programs providing upgrading and retraining courses are helping this indigenous group to achieve greater labour force participation.

At present the Department of Indian Affairs and Northern Development, in conjunction with the Territorial governments, is working towards improving the effectiveness of the various educational programs. Areas which are being given particular attention include:

a) Expansion of the basic education system to encompass all school age children;

b) The provision of pre-school courses (e.g., in language and basic knowledge) which help to prepare indigenes for schooling;

c) The extension of adult education programs, including language upgrading courses;

d) The extension of Occupational Training for Adults programs;

e) Encouragement of more indigenes to take advantage of present educational opportunities;

f) Mobility and relocation assistance;

g) The provision of more vocational and advanced education opportunities – this includes a detailed assessment of the type of programs required;

h) Involvement of Territorial employers in planning the type of vocational training required.

Responsibility for the provision and development of basic and vocational education programs lies mainly with the Department of Indian Affairs and Northern Development, but the Department of Manpower and Immigration has responsibility for certain types of adult occupational training and for the provision of counselling and labour market information services. At present the Department of Indian Affairs and Northern Development performs certain functions which are normally the responsibility of the Department of Manpower and Immigration and will continue to do so until that Department is able to provide staff and Canada Manpower Centres in the Territories.

## TABLE 9A-1

### Distribution of Population of the Yukon & N.W.T., by Major Ethnic Groups, Age Groups and Sex 1961

| Age Group | Native Indians[a] | | | Per Cent by | All Other Ethnic Groups | | | Per Cent by | Total | | | Per Cent by Age Group | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Male | Female | Total | Age Group | Male | Female | Total | Age Group | Male | Female | Total | Y.T. | CAN. |
| 1. YUKON TERRITORY | | | | | | | | | | | | | |
| 0 – 4 | 209 | 200 | 409 | 18.6 | 1,009 | 919 | 1,928 | 15.5 | 1,218 | 1,119 | 2,337 | 16.0 | 12.4 |
| 5 – 9 | 153 | 161 | 314 | 14.2 | 730 | 717 | 1,447 | 11.6 | 883 | 878 | 1,761 | 12.0 | 11.4 |
| 10 – 14 | 120 | 111 | 231 | 10.5 | 486 | 470 | 956 | 7.7 | 606 | 581 | 1,187 | 8.1 | 10.2 |
| 15 – 19 | 96 | 123 | 219 | 9.9 | 286 | 260 | 546 | 4.4 | 382 | 383 | 765 | 5.2 | 7.8 |
| 20 – 24 | 88 | 89 | 177 | 8.0 | 549 | 383 | 932 | 7.5 | 637 | 472 | 1,109 | 7.6 | 6.5 |
| 25 – 32 | 118 | 154 | 272 | 12.3 | 1,589 | 1,095 | 2,684 | 21.6 | 1,707 | 1,249 | 2,956 | 20.2 | 13.6 |
| 35 – 44 | 96 | 105 | 201 | 9.1 | 1,146 | 771 | 1,917 | 15.4 | 1,242 | 876 | 2,118 | 14.5 | 13.1 |
| 45 – 54 | 77 | 73 | 150 | 6.8 | 677 | 416 | 1,093 | 8.8 | 754 | 489 | 1,243 | 8.5 | 10.3 |
| 55 – 64 | 45 | 41 | 86 | 3.9 | 405 | 186 | 591 | 4.8 | 450 | 227 | 677 | 4.6 | 7.1 |
| 65 – 69 | 15 | 33 | 48 | 2.2 | 86 | 46 | 132 | 1.1 | 101 | 79 | 180 | 1.3 | 2.7 |
| 70+ | 45 | 55 | 100 | 4.5 | 153 | 42 | 195 | 1.6 | 198 | 97 | 295 | 2.0 | .0 |
| TOTAL | 1,062 | 1,145 | 2,207 | 100.0 | 7,116 | 5,305 | 12,421 | 100.0 | 8,178 | 6,450 | 14,628 | 100.0 | 100.0 |

NOTE: [a] Includes Eskimos as at time of 1961 Census, there were only 40 Eskimos recorded in the Yukon.

## TABLE 9A-1

### Distribution of Population of the Yukon & N.W.T. by Major Ethnic Groups, Age Groups and Sex 1961

| Age Group | Native Indian Male | Native Indian Female | Native Indian Total | Per Cent by Age Group | Eskimo Male | Eskimo Female | Eskimo Total | Per Cent by Age Group |
|---|---|---|---|---|---|---|---|---|
| 2. NORTHWEST TERRITORIES | | | | | | | | |
| 0 — 4 | 401 | 463 | 864 | 16.4 | 806 | 774 | 1,580 | 19.8 |
| 5 — 9 | 389 | 372 | 761 | 14.6 | 579 | 549 | 1,128 | 14.1 |
| 10 — 14 | 321 | 364 | 685 | 13.0 | 539 | 512 | 1,051 | 13.2 |
| 15 — 19 | 227 | 211 | 438 | 8.3 | 372 | 382 | 754 | 9.5 |
| 20 — 24 | 206 | 219 | 425 | 8.1 | 348 | 364 | 712 | 8.9 |
| 25 — 34 | 335 | 335 | 670 | 12.7 | 578 | 519 | 1,097 | 13.8 |
| 35 — 44 | 248 | 217 | 465 | 8.9 | 418 | 347 | 765 | 9.6 |
| 45 — 54 | 198 | 171 | 369 | 7.0 | 280 | 218 | 498 | 6.2 |
| 55 — 64 | 147 | 146 | 293 | 5.6 | 127 | 118 | 245 | 3.1 |
| 65 — 69 | 58 | 47 | 105 | 2.0 | 35 | 38 | 73 | 0.9 |
| 70+ | 89 | 92 | 181 | 3.4 | 41 | 33 | 74 | 0.9 |
| TOTAL | 2,619 | 2,637 | 5,256 | 100.0 | 4,123 | 3,854 | 7,977 | 100.0 |

| Age Group | All Other Ethnic Groups Male | All Other Ethnic Groups Female | All Other Ethnic Groups Total | Per Cent by Age Group | Total Male | Total Female | Total Total | Per Cent by Age Group N.W.T. | Per Cent by Age Group CAN. |
|---|---|---|---|---|---|---|---|---|---|
| 0 — 4 | 769 | 677 | 1,446 | 14.8 | 1,976 | 1,914 | 3,890 | 16.9 | 12.4 |
| 5 — 9 | 564 | 471 | 1,035 | 10.6 | 1,532 | 1,392 | 2,924 | 12.7 | 11.4 |
| 10 — 14 | 355 | 322 | 677 | 6.9 | 1,215 | 1,198 | 2,413 | 10.5 | 10.2 |
| 15 — 19 | 306 | 201 | 507 | 5.2 | 905 | 794 | 1,699 | 7.4 | 7.8 |
| 20 — 24 | 756 | 346 | 1,102 | 11.3 | 1,310 | 929 | 2,239 | 9.8 | 6.5 |
| 25 — 34 | 1,490 | 748 | 2,238 | 22.9 | 2,403 | 1,602 | 4,005 | 17.4 | 13.6 |
| 35 — 44 | 883 | 516 | 1,399 | 14.3 | 1,549 | 1,080 | 2,629 | 11.4 | 13.1 |
| 45 — 54 | 550 | 265 | 815 | 8.4 | 1,028 | 654 | 1,682 | 7.3 | 10.3 |
| 55 — 64 | 282 | 103 | 385 | 4.0 | 556 | 367 | 923 | 4.0 | 7.1 |
| 65 — 69 | 58 | 24 | 82 | 0.8 | 151 | 151 | 260 | 1.1 | 2.6 |
| 70+ | 67 | 12 | 79 | 0.8 | 197 | 137 | 334 | 1.5 | 5.0 |
| TOTAL | 6,080 | 3,685 | 9,765 | 100.0 | 12,822 | 10,176 | 22,998 | 100.0 | 100.0 |

## TABLE 9A-2

### Labour Force by Occupation and Major Ethnic Groups by Sex
### 1961

| Occupation | Native Indian[a] | | | Per Cent | All Other Ethnic Groups | | | Per Cent | Total | | | Per Cent | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Male | Female | Total | (of total) | Male | Female | Total | (of total) | Male | Female | Total | Y.T. | CAN. |
| 1. YUKON TERRITORY | | | | | | | | | | | | | |
| Managerial | 3 | — | 3 | 0.7 | 409 | 89 | 498 | 8.6 | 412 | 89 | 501 | 8.0 | 8.8 |
| Professional & technical | 3 | 1 | 4 | 0.9 | 290 | 207 | 497 | 8.5 | 293 | 208 | 501 | 8.0 | 9.7 |
| Clerical | — | — | — | | 194 | 432 | 626 | 10.8 | 194 | 432 | 626 | 10.0 | 12.9 |
| Sales | 3 | — | 3 | 0.7 | 70 | 88 | 158 | 2.7 | 73 | 88 | 161 | 2.6 | 6.8 |
| Service & recreation | 32 | 62 | 94 | 22.1 | 658 | 401 | 1,059 | 18.2 | 690 | 463 | 1,153 | 18.5 | 12.8 |
| Transportation & communication | 21 | — | 21 | 4.9 | 622 | 18 | 640 | 11.0 | 643 | 18 | 661 | 10.6 | 6.1 |
| Farmers & farm workers | 10 | — | 10 | 2.3 | 23 | — | 23 | 0.4 | 33 | — | 33 | 0.5 | 10.0 |
| Loggers & related workers | 13 | — | 13 | 3.1 | 29 | — | 29 | 0.5 | 42 | — | 42 | 0.7 | 1.2 |
| Fishermen, trappers & hunters | 61 | 5 | 66 | 15.5 | 8 | 1 | 9 | 0.2 | 69 | 6 | 75 | 1.2 | 0.5 |
| Miners, quarrymen & related workers | 12 | — | 12 | 2.8 | 559 | 1 | 560 | 9.6 | 571 | 1 | 572 | 9.2 | 1.0 |
| Craftsmen, production process & related workers | 49 | 2 | 51 | 12.0 | 1,248 | 21 | 1,269 | 21.8 | 1,297 | 23 | 1,320 | 21.1 | 24.2 |
| Labourers, n.e.s. | 118 | — | 118 | 27.7 | 215 | 8 | 223 | 3.8 | 333 | 8 | 341 | 5.5 | 4.9 |
| Occupation not stated | 23 | 8 | 31 | 7.3 | 163 | 62 | 225 | 3.9 | 186 | 70 | 256 | 4.1 | 2.6 |
| TOTAL, ALL OCCUPATIONS | 348 | 78 | 426 | 100.0 | 4,488 | 1,328 | 5,816 | 100.0 | 4,836 | 1,406 | 6,242 | 100.0 | 100.0 |

NOTE: [a] Eskimos included with Indians as only 40 Eskimos in Yukon at time of 1961 Census.

## TABLE 9A-2

### Labour Force by Occupation and Major Ethnic Groups by Sex
### 1961

| Occupation | Native Indian | | | Per Cent | Eskimo | | | Per Cent |
|---|---|---|---|---|---|---|---|---|
| | Male | Female | Total | (of total) | Male | Female | Total | (of total) |
| 2. NORTHWEST TERRITORIES | | | | | | | | |
| Managerial | 1 | – | 1 | 0.1 | 6 | – | 6 | 0.3 |
| Professional & technical | 3 | 1 | 4 | 0.4 | 25 | 2 | 27 | 1.5 |
| Clerical | 3 | – | 3 | 0.3 | 5 | 3 | 8 | 0.5 |
| Sales | 10 | 8 | 18 | 2.0 | 9 | 3 | 12 | 0.7 |
| Service & recreation | 41 | 98 | 139 | 15.3 | 121 | 70 | 191 | 10.8 |
| Transportation & communication | 16 | 1 | 17 | 1.9 | 23 | – | 23 | 1.3 |
| Farmers & farm workers | 2 | – | 2 | 0.2 | 14 | – | 14 | 0.8 |
| Loggers & related workers | 8 | – | 8 | 0.9 | 1 | – | 1 | 0.1 |
| Fishermen, trappers & hunters | 494 | 7 | 501 | 55.3 | 1,015 | 5 | 1,020 | 57.8 |
| Miners, quarrymens & related workers | 10 | – | 10 | 1.1 | 43 | – | 43 | 2.4 |
| Craftsmen, production process & related workers | 62 | 12 | 74 | 8.2 | 123 | 18 | 141 | 8.0 |
| Labourers, n.e.s. | 102 | 2 | 104 | 11.5 | 232 | 2 | 234 | 13.3 |
| Occupation not stated | 17 | 8 | 25 | 2.8 | 43 | 2 | 45 | 2.5 |
| TOTAL, all occupations | 769 | 137 | 906 | 100.0 | 1,660 | 105 | 1,765 | 100.0 |

| Occupation | All Other Ethnic Groups | | | Per Cent | Total | | | Per Cent | |
|---|---|---|---|---|---|---|---|---|---|
| | Male | Female | Total | (of total) | Male | Female | Total | N.W.T. | CAN. |
| Managerial | 374 | 27 | 401 | 8.4 | 381 | 27 | 408 | 5.5 | 8.3 |
| Professional & technical | 496 | 259 | 755 | 15.8 | 524 | 262 | 786 | 10.5 | 9.7 |
| Clerical | 170 | 176 | 346 | 7.2 | 178 | 179 | 357 | 4.8 | 12.9 |
| Sales | 63 | 52 | 115 | 2.4 | 82 | 63 | 145 | 1.9 | 6.3 |
| Service & recreation | 501 | 248 | 749 | 15.7 | 663 | 416 | 1,079 | 14.5 | 12.3 |
| Transportation & communication | 413 | 21 | 434 | 9.1 | 452 | 22 | 474 | 6.4 | 6.1 |
| Farmers & farm workers | 7 | – | 7 | 0.1 | 23 | – | 23 | 0.3 | 10.0 |
| Loggers & related workers | 18 | – | 18 | 0.4 | 27 | – | 27 | 0.4 | 1.2 |
| Fishermen, trappers & hunters | 59 | – | 59 | 1.2 | 1,568 | 12 | 1,580 | 21.2 | 0.5 |
| Miners, quarrymen & related workers | 495 | – | 495 | 10.4 | 548 | – | 548 | 7.4 | 1.0 |
| Craftsmen, production process & related workers | 799 | 9 | 808 | 16.9 | 984 | 39 | 1,023 | 13.7 | 24.2 |
| Labourers, n.e.s. | 195 | 6 | 201 | 4.2 | 529 | 10 | 539 | 7.2 | 4.9 |
| Occupation not stated | 369 | 24 | 393 | 8.2 | 429 | 34 | 463 | 6.2 | 2.6 |
| TOTAL, all occupations | 3,959 | 822 | 4,781 | 100.0 | 6,388 | 1,064 | 7,452 | 100.0 | 100.0 |

Source: Dominion Bureau of Statistics

## TABLE 9A-3

### Total Population of the Territories, 1911 – 1966

Year

| | 1911 | 1921 | 1931 | 1941 | 1951 | 1961 | 1966 |
|---|---|---|---|---|---|---|---|
| N.W.T. | 6,507 | 7,988 | 9,723 | 12,028 | 16,004 | 22,998 | 28,738 |
| YUKON | 27,219 | 8,513 | 4,157 | 4,230 | 4,914 | 14,628 | 14,382 |
| TOTAL | 33,726 | 16,501 | 13,880 | 16,258 | 20,918 | 37,626 | 43,120 |

Source: Dominion Bureau of Statistics

### Population Density, Canada, Selected Provinces and Territories, 1961

| | | | | | |
|---|---|---|---|---|---|
| N.W.T. | 0.02 | persons | per | square | mile |
| Yukon | 0.07 | " | " | " | " |
| Newfoundland | 3.20 | " | " | " | " |
| Prince Edward Is. | 47.91 | " | " | " | " |
| Ontario | 18.12 | " | " | " | " |
| B.C. | 4.53 | " | " | " | " |
| Canada | 5.12 | " | " | " | " |

Source: Canada Year Book, 1965

### 9A–1.1.2 – Requirements and Attitudes

There is an increasing tendency for most industries to require the services of fewer unskilled labour resources, and the mining industry is no exception to this tendency. This tendency not only severely limits the opportunities for unskilled workers, but it also limits opportunities for casual workers. Positions calling for skilled and semi-skilled workers which generally involve work on a day-to-day basis may be available.

With the exception of the younger, more educated group, there are few indigenous labour groups possessing the skills and aptitudes required by the modern enterprise. Few older indigenes can be classified as skilled or semi-skilled workers and some members of this group prefer to work on a casual day-to-day basis. For such workers employment opportunities are greatly affected by the employment attitudes of the mining company concerned. If the company displays patience and understanding some progress can be made, for experience has shown that it may take some time for indigenous workers to become accustomed to industrial conditions and to learn new skills and responsibilities. However, if indigenes are given time to build up physical strength, adjust socially, and learn job skills, initial problems can be markedly decreased. These initial problems are complex and their solution requires close co-operation between company and government personnel. For example, companies cannot be expected to accept continued absenteeism and low-productivity from their employees, yet in the long run companies stand to gain from employing more indigenes – through lower hiring costs and turnover rates.

Currently, governmental agencies are involved in close liaison with Territorial companies in such areas as:

a) Determination of the labour requirements of the companies;

b) Initiation and maintenance of contacts with indigenes who could conceivably meet the companies' labour requirements;

c) Arranging and co-ordinating of required training programs – on the job and/or at specific training centres;

d) Investigation of the need for payments to the company (per worker) during the first few months of employment;

e) Checking the physical fitness and dietary need of indigenes during the initial period of employment;

f) Facilitating the integration of indigenes into the community, for example, by planning recreation programs, and by conducting home management programs.

With close co-operation between government and industry, there could be a significant increase in the employment of the older and relatively uneducated indigenes. The problems associated with the employment of the younger (generally better educated) indigenes are not as great, but here again co-operation is necessary to ensure that the potential of these labour resources is fully realized.

### 9A–1.1.3 – Social Problems

Better education alone does not ensure that indigenes will be employed by northern employers. Many of these people (even in the younger generation) retain strong bonds with their traditional environment and complete acceptance of the industrial way of life cannot be expected immediately. The social integration and acceptance of indigenes will only occur gradually but the type of government/industry co-operation discussed above should help to alleviate transition problems.

**9A–1.1.4 – Housing**

Housing is a very important factor in the social integration and continued employment of indigenes. Experience has shown that married male indigenes are often very reluctant to leave their wives and families for more than a few weeks at a time. This is also a problem with non-indigenous married males, but it appears to be much more serious in the case of indigenes. To help overcome the problem, the Department operates several programs whereby houses are provided for indigenous people on a variety of bases (grant, purchase, rental).

Problems associated with the employment of indigenous people are currently the subject of several studies being undertaken by the Department of Indian Affairs and Northern Development. It is hoped that these and other studies will help to further accelerate the process of absorbing more indigenes into the territorial work force and so enable these people, and their employers, to further benefit from economic development of the region.

## 9A–2.1 – YUKON

### 9A–2.1.1 History

The Indians of the Yukon Territory divide into two principal groups; the Déné or Athapaskans in the interior, and a northern fringe of the Tlingit tribe who live in the south-western part of the Territory. The Dene people are again divided. The Loucheux tribe is found primarily in the Peel and Porcupine River areas with their main settlement at Old Crow. A second tribe, made up of Kutchin Indians, live in the Yukon River watershed to the south. The Kutchins are often referred to as the "Sitck" Indians, a term meaning "of the forest". In addition to the Dene and Tlingit groups, a few Nahanni Indians are found in the southeastern corner of the Yukon Territory near Frances Lake and the streams draining into the Liard River.

Archaeological remains indicate that the short Arctic Coast of the Yukon (about 135 miles) once supported a fairly substantial Eskimo population. There are no Eskimo communities on this coast now; most of the Eskimos found in this area are travelling along the coast to or from the Mackenzie Delta or Alaska.

Before the arrival of Europeans in the Yukon, the natives depended entirely on fishing and hunting for their livelihood. As elsewhere, their way of life has changed considerably following white settlement in the area. This is particularly true in the southern Yukon and along the Yukon River where the younger generations of Indians have adopted "white" ways very rapidly.

The first available census figure in 1895 shows an estimated population of 2,600 Indians in the Yukon. In 1912, when the provincial and territorial boundaries assumed their present pattern, population was 1,839. In 1929, the Indian population sank to a record low of 1,264 and then it began to increase at a steady rate. In July 1965, the population stood at 2,460, just slightly less than the figure for 1895.

There appears to have been little or no "white" penetration of the Yukon Territory until the middle of the 19th century. Although the Russians had been exploring and exploiting Alaska since its discovery in 1741, they had penetrated inland only 300 miles from the Bering Sea by 1838, some 600 miles from what was to become the Yukon border.

Fur was the initial attraction to the Yukon, but gold quickly displaced it. Although the presence of gold was suspected, it was not until 1873 that prospectors began arriving in the Yukon in significant numbers. Many of the earlier arrivals came from California when the strike of '49 had passed. Some entered the Yukon from the north up the Yukon River from Alaska. Others coming in from the south were the first to cross the Chilkoot Pass in 1878. With the influx of miners, of whom there were several hundred by 1884, many of the fur posts turned to trading in prospectors' supplies, and a water supply route was established by river steamers on the Yukon River. In August 1896, the famous Klondike strike was made on Bonanza Creek. Thousands of gold seekers poured into the area, and Dawson City, at the junction of the Klondike and Yukon Rivers, quickly grew into a mining, and trading community of some 25,000 people and captured a colorful place in Canadian history.

By 1901 the total population of the Yukon was over 27,000 and of this total about 3,000 or nearly 12 per cent were Indians. Nearly all of the 24,000 whites were in the vicinity of Dawson City and in search of gold. However, by 1902 and 1903, the successful began to leave and by 1910 the population of the Yukon had fallen to 8,512.

For the next 35 years, until the mid-years of World War II, the population fluctuated between 4,000 and 5,000. During this period the Indian population accounted for one-third of the total. From 1941 to 1951 the population doubled from 4,194 to 9,906. This impressive increase resulted from the influx of construction workers and military personnel required to build and maintain national defence installations and communications facilities.

The upward trend continued after the war and during the ten-year period 1951–61, the population increased 47 per cent to 14,628. This growth can be attributed mainly to increased exploitation of the Territory's natural resources and to expanded government activity.

**9A–2.1.2 – Population Characteristics**

The 1961 Census showed nearly all of the inhabitants of the Territory to be resident in or around Whitehorse and five smaller communities. Some 5,031 persons, or 34 per cent of the total population, lived within the municipal boundaries of Whitehorse. Add those in the surrounding subdivisions and about one-half of the Yukoners are accounted for. The major part of the remaining population was divided between Dawson City, Watson Lake, Elsa, Calumet and Mayo. Within this pattern the Indian population numbered 2,027 or almost 15 per cent of the total.

The Yukon population in the 0 to 4 year-age group is 33 per cent higher than the similar age group for Canada as a whole. However, the 10 to 19 year-age group shows a marked decrease and is, in fact, 25 per cent lower than comparable national figures. This is due in part to the high birth rate of the Indian population (which accounted for almost 15 per cent of the total population in 1961).

The definite downward trend from the infant group to the teenage group reflects both the higher than normal infant mortality amongst the Indian people and the tendency for many white families to more "outside" in search of better educational facilities at the secondary school level. This latter factor has decreased substantially with the greatly improved secondary and trade schools which have been built in Whitehorse, Dawson and Watson Lake, since 1960; but a large percentage of the white children are still either pre-school age or early school-grade students.

The white population in the 20 to 40 year-age group numbers nearly 45 per cent of the total. Besides contributing to the higher than normal birth rate, this distribution indicates the itinerant nature of much of the white segment who come to the Yukon to work and then leave after a few years. The presence of relatively large groups of military personnel and Federal Government employees is significant. They move at government expense and constitute a much larger portion of the Yukon population than would be the case in the provinces.

Yukoners, 60 years of age and over, represent only approximately 5 per cent of the total population, whereas for Canada this group represents a substantial 11 per cent. Again this can be attributed to the fact than many of the adult whites leave the Yukon for family reasons given earlier or when they retire.

The 1961 Cencus recorded 8,178 males and 6,450 females in the Yukon. This ratio of 126 males to 100 females is considerably higher than the all-Canada ratio of 102 males to 100 females. Although significant, this inbalance is not unusual in a frontier area.

**9A–2.1.3 – Labour Force**

The Yukon Territory has 64 per cent of its population within the potential labour force age group, that is, 15 years of age and over. This compares with the all-Canada figure of 66 per cent. The figure for the experienced labour force in the Yukon of 67 per cent is considerably higher than the national figure of 54 per cent and reflects to some degree the disproportionate ratio of males to females within the Territory compared with Canada as a whole.

As with the Northwest Territories, the percentages of wage earners and experienced workers in the potential labour force are significantly lower for indigenes than they are for other ethnic groups. Again it is emphasized that although this is the current situation, the participation rates of indigenes are showing significant rates of increase.

## 9A–3.1 – NORTHWEST TERRITORIES

### 9A–3.1.1 – History

Before the white man arrived in the Northwest Territories the Indians and Eskimos had evolved successful cultures of seasonal nomadism based on hunting and fishing. Mammals, birds and fish provided food, clothing, fat and oil for heating and lighting, implements and even weapons for the hunt. That state of existence prevailed, more or less unaltered, for four to five thousand years with the Eskimos inhabiting the arctic coastal areas and treeless tundra and the Indians the sub-arctic spruce forests.

There were several tribes of Indians chiefly of the Athapaskan linguistic stock. In the east, the Chipewyans ranged from Hudson Bay to Lake Athabasca; to the northwest there were the Yellowknifes, the Dogribs, the Hare and the Bear Lake Indians. The Slaves and Loucheux occupied the Mackenzie River Valley. These tribes consisted of bands of varying size under the leadership of one strong man or chief. They roamed in small bands, often camping for several weeks or even months at a fishing area or caribou crossing. The Athapaskan tribes made frequent trips into the tundra during the summer and fall to hunt caribou and muskoxen, going as far as the arctic coast in the vicinity of Coronation Gulf.

The Eskimos, with the exception of a group in the interior of Keewatin, had developed a primarily coastal culture. They were divided into small family groups and moved with the game resources of their region. Usually, they hunted in the coastal areas but in summer they made special hunts inland for caribou and muskoxen. They also made occasional trips to the vicinity of the tree-line to cut wood for sledge runners, tools and implements.

Although their hunting areas were adjacent and their way of life similar, the Indians and Eskimos remained apart and seldom met except in strife. There was little or no cultural exchange and no intermarriage between the two races.

The European explorers of the 16th, 17th and 18th centuries were the first white men to contact the Indians and the Eskimos. Although encounters between explorers and northern natives were numerous during that period, they did not result in much change in the traditional native way of life. The explorers were followed by the whalers and the fur traders and they, in turn, by the missionaries, Royal Canadian Mounted Police, and northern pioneers. Small settlements grew up around the trading posts and missions along the main waterways and introduced a new way of life to the North.

It was the fur trade that had the greatest impact on the northern peoples. The Indians and Eskimos were encouraged to trap fur bearers which previously had little use and as a result they spent less time at their traditional hunting pursuits. The rifle enabled them to kill game more efficiently but larger dog teams were necessary for winter travel on their new traplines. These developments made excessive demands on the game resources over wide areas.

At the same time the isolated trading posts gradually became permanent settlements as Indian or Eskimo families settled near the source of trade goods and were attracted by the white man's activities. Many of the settlements became centres of transportation and jumping off spots to the interior for trappers, prospectors and government research parties.

By 1900 there were 13 settlements in the Mackenzie Valley connected by water transportation; in the eastern Arctic there were only a few isolated trading posts. When the present boundaries of the Northwest Territories were set in 1912, the population was over 6,000 persons of which all but a small proportion were Indians and Eskimos.

In the following fifty years there was a steady increase in the population of the Territories. The growth in the Indian and Eskimo populations during that period resulted from a fairly rapid rate of natural increase, while the growth in the white population of the Territories was due mainly to immigration. People moved north in response to various resource developments and government programs. The number of whites in the Territories was less than 1,000 in 1921, but had more than doubled by 1941. The fur resources and the discovery of oil at Norman Wells attracted an influx of whites in the 1920s. Discovery of gold at Yellowknife and pitchblende at Great Bear Lake in the 1930s brought increasing numbers to the Mackenzie District and led to the establishment of Federal Government administrative centres. In the 1940's activities connected with the war, the Canol pipeline, airfield construction, and uranium mining at Great Bear Lake, spurred additional immigration. In the decade preceding the 1961 Census the total territorial population increased by 43 per cent, the white population alone by 83 per cent. This impressive growth in the white population resulted from greatly expanded government activities in the North, mainly defence and social programs, and extensive construction and road building. By 1966 the population had increased to 28,738.

**9A–3.1.2 – Population Characteristics**

Although the "white" group includes Metis, enfranchised Indians and people of other ethnic origin, it is composed primarily of people of European descent who made up 91 per cent of the group and 39 per cent of the total population of the Territories in 1961.

Two striking features of the territorial population are the high-proportion of the population in the very young, 0–4 years age group, and the very low proportion of the population in the 60 years and over age group. The high birth rate of the native population is the most important factor in the large percentage in the very young age group. Factors contributing to the small percentage of the population in the over 60 age group are the high death rates of the native people, particularly of the Eskimos, and the strong tendency on the part of whites, especially those not born in the Territories, to leave at or near retirement age.

The proportion in the teenage groups (10 to 14 and 15 to 19 years) in the population of the Northwest Territories is similar to the proportion in these age groups in the population of the rest of Canada.

That portion of the population in the age group of 20 to 44 years constitutes the prime labour force of a region and most important to its economy. Employment statistics for all of Canada show that people in this age group enjoy the highest rate of employment of all potentially employable persons. The proportion of the population of the Territories in this age group is significantly higher than for Canada as a whole. However, the number in this group is somewhat biased because of the seasonal nature of employment in the North. Census data are gathered during the summer months when there is an influx into the Territories of seasonal workers in all categories of employment, from construction to research, and they are recorded in the data for the Territories; Exclusion of these seasonal workers would probably bring the percentage for this age group more into line with that for the rest of Canada.

The population of the Territories also has a high ratio of males to females. The 1961 Census showed 126 males to each 100 females. No doubt, the high male-female ratio in the Territories was also affected by the influx of seasonal workers who were almost all male.

**9A–3.1.3 – Labour Force**

Usually a region with a large potential labour force (population 15 years of age and over) in relation to its total population has a major asset for favourable economic growth and development. The Northwest Territories has 60 per cent of its population within this potential labour force age range as compared with 66 per cent for all Canada in 1961. The percentage for the experienced labour force in the Territories is in line with the percentages for Canada and the provinces and the percentage of wage earners is only slightly lower.

The distribution of this potential labour force shows that 7,165 persons or 52 per cent, were Indians and Eskimos. However, only 2,671 of these or 34 per cent qualified in the experienced labour force category.

Carrying the analysis further to the actual wage earners at the time of the 1961 Census, there were only 392 Indians and 723 Eskimos employed in contrast with 4,321 white wage earners. Thus only 16 per cent of the Indian and Eskimo potential labour force were wage earners while 65 per cent of the white population in this category were earning wages.

Despite the markedly lower work force participation rates of territorial indigenous people, it must be emphasized that this situation is expected to alter significantly in the near future.

## INDEX

## GOODS AND SERVICES "B"

# DATA SHEET – GOODS AND SERVICES

## 9B–1.1 – CONSUMER PRICES

The cost of living North of 60 varies considerably, and ranges from about 20 to 40% higher than in southern Canada.

Following is an estimation of the price differences in the Yukon and Northwest Territories, compared with southern Canada. Southern Canada is used as the base for comparison at 100%.

The levels shown are typical of the differences existing in the more accessible regions of the two Territories. In the far northern mainland and the Arctic Islands, the differences may be twice as great. Figures are based on 1966 prices, the latest figures available.

| | Southern Canada | Territories |
|---|---|---|
| Food | 100 | 125 |
| Tobacco and alcoholic beverages | | |
| Tobacco products and smokers' accessories | 100 | 100 |
| Alcoholic beverages excluding beer | 100 | 110 |
| Beer | 100 | 200 |
| Clothing and personal furnishings | | |
| Men's and boys' clothing | 100 | 110 |
| Women's and children's clothing | 100 | 110 |
| Footwear | 100 | 110 |
| Laundry and dry cleaning | 100 | 110 |
| Other | 100 | 110 |
| Shelter | 100 | 130 |
| Household operation | | |
| Fuel Oil | 100 | 180 |
| Electricity | 100 | 200 |
| Gasoline | 100 | 125 |
| Telephone | 100 | 120 |
| Furniture | 100 | 110 |
| Home Furnishing | 100 | 110 |
| Appliances, radios and television sets | 100 | 110 |
| Other | 100 | 110 |
| Transportation | | |
| Streetcar, railway and other fares | 100 | 110 |
| New automobiles, used automobiles & House trailers | 100 | 100 |
| Automotive operating expenses | 100 | 130 |
| Personal and medical care and death expenses. | | |
| Medical and dental care | 100 | 110 |

| | | |
|---|---|---|
| Hospital care, private duty nursing, accident and sickness insurance, prepaid medical care. | 100 | 110 |
| Other | 100 | 110 |
| Miscellaneous | | |
| Motion picture theatres | 100 | 100 |
| Newspapers and magazines | 100 | 110 |
| Net expenditure abroad | 100 | 100 |
| Other | 100 | 110 |

No radio or television station in the Northwest Territories permits advertising to be sold, although as part of the Canadian Broadcasting Corporation national network commercial advertising does appear on both mediums.

Display newspaper advertising rates range from $1.08 - $1.50 a column inch in the four newspapers published in the Mackenzie District. Legal rates are generally 25 cents an agate line.

**9B–1.1.1 – Taxes**

Generally, residents of the Yukon and Northwest Territories are free of many of the taxes paid by Canadians living in the provinces.

Property taxes, including their counterpart (occupancy or rental taxes) which are the major financial base for all municipal or county activities, are levied in only six Territorial communities - Whitehorse and Dawson in the Yukon, and Yellowknife, Hay River, Fort Smith and Inuvik, in the Northwest Territories.

Property tax rates in these six communities vary widely, and therefore it is not possible to obtain a fair comparison with provincial rates. In addition, these communities do not have uniform procedures for handling special assessments and flat rate charges for such services as sewer, water, roads and business.

Many services provided, which would normally be paid through municipal and provincial taxes, are subsidized by the Federal Government or assisted through grants.

Some sample mill rates in the Northwest Territories:

| YELLOWKNIFE | | INUVIK | |
|---|---|---|---|
| General | 32 | General | 15 |
| School | 40 | School | 12 |
| Business Tax | 36 | No business tax | |

| FORT SMITH | | HAY RIVER | |
|---|---|---|---|
| General | 23 | General | 38 |
| School | 12 | School | 12 |
| No business tax | | Business tax | 19 |

Provincial sales taxes which are levied in most Canadian provinces, and which vary in size from 3 to 8%, are not levied in the two Territories.

Less tax is paid to operate motor vehicles in these regions. Motor fuel in the Northwest Territories is taxed at 7.5 cents per gallon, and in the Yukon Territory at 4.1 cents, or one-half to one-third less than the tax levied in the provinces.

License fees for most motor vehicles are considerably less than those charged in the provinces. For example, the following fees are charged under the Motor Vehicle Ordinance of the Yukon Territory:

a) *Operators licenses* are for a one-year period and may be obtained on production of a valid license from any other province in Canada or any of the United States. First issues must pass a written and a driver's test. Fee $2.00.

b) *Chauffeurs licenses* are the same as operators licenses, except that the written test has a few more questions. Fee $5.00.

c) *Automobile licenses* are issued for a one-year period. The fee is based on the wheelbase of the vehicle:

| | |
|---|---|
| Under 100" | - $15.00 |
| 101" - 120" | - $20.00 |
| Over 120" | - $25.00 |

A reduction of 50% is made on October 1, and a reduction of 75% on January 1.

d) *Truck licenses* are divided into four categories based on hauling capacity:

| | |
|---|---|
| 1 ton or less | $20.00 |
| Over 1 ton to 3 tons | $35.00 |
| Over 3 tons to 5 tons | $55.00 |
| Over 5 tons | $105.00 |

A reduction of 50% is made on October 1 and a reduction of 75% on January 1.

e) *PSV and RES licenses* are licenses to haul goods in the Yukon Territory. The PSV license is non-restricted authority. The RES is a restricted authority. As in the other provinces of Canada, there is a requirement for advertising, filing of objections and if required, a public hearing, before the license is issued. These licenses are divided into categories:

| | |
|---|---|
| Over 1 ton to 3 tons | $ 35.00 |
| Over 3 tons to 5 tons | $130.00 |
| Over 5 tons but with only two axles | $155.00 |
| More than two axles | $255.00 |

f) *Trailer licenses* are issued in two categories only:

| | |
|---|---|
| 1 ton or less | - $3.00 |
| Over 1 ton | - $10.00 |

g) *Through freighter licenses* are issued with the designation FT. These licenses are issued for hauling goods through the Territory only and are issued in only two categories:

| | |
|---|---|
| 5 tons and under | - $105.00 |
| Over 5 tons | - $205.00 |

h) *Single trip permits* may be obtained from the agent at Watson Lake in two categories: for hauling goods into and out of the Territory, one single trip $100.00; and hauling goods through the Territory only, $50.00

i) *Compulsory insurance* in an amount not less than $50,000 all-inclusive must be proven before any vechicle license is issued.

**9B–1.1.2 Business Licenses and Regulations**

Other examples of license and regulation requirements in the Yukon Territory:

a) *Business license ordinance*. Any person or company wishing to do business in the Yukon outside the limits of the City of Dawson or the City of Whitehorse, must obtain a business license. These licenses are divided into a number of categories, the greater number of which are issued for a fee of $25.00. One notable exception is the Contractors License which is $100.00 for non-resident and $50.00 for a resident. Any company applying for a business license must produce proof of Workmen's Compensation insurance coverage for his employees, or take a statutory declaration to the effect that he does not have employees and that he will, if he becomes an employer, immediately take out Workmen's Compensation coverage.

At the present time, the publishing of newspaper and the business of searching for minerals, are exempted from the Business License Ordinance.

b) *Lien legislation*. The central office for the registration of liens is in the Department of the Territorial Secretary and Registrar General. Liens may be registered under the Bills of Sale Ordinance at a fee of $1.00 per document; the Garage Keepers Lien Ordinance; the Conditional Sales Ordinance at $1.00 per document, and also the Assignment of Book Debts Ordinance at a fee of 50c per document

c) *Companies Ordinance*. Any company doing business in the Territories must either be incorporated under the Companies Ordinance or registered extra-Territorially under the Ordinance. Registration and incorporation fees are determined by the amount of capital to be invested in the Territory.

d) *Corporation Securities Ordinance*. This Ordinance applies to the registration of mortgages or charges of chattels, or assignment of book debts of a corporation. Registration of either mortgage charge or assignment should be effected by filing with the Registrar within 30 days of the execution of the instrument. Fees are $1.00 per document.

e) *Securities*. Before any securities may be sold in the Yukon they must be registered under the Securities Ordinance. This may be accomplished by filing a copy of the Prospectus of the company, approved by the Securities Commission of B.C., Alberta, or Ontario, with the Registrar of Securities.

f) *Workmen's Compensation*. All employees in the Yukon Territory must be covered with Workmen's Compensation under the Yukon Work's Compensation Ordinance. This can be accomplished either by obtaining an exemption order for those employees covered by extended provincial coverage, or by purchasing a policy of Workmen's Compensation insurance to cover those employees hired in the Yukon Territory. The compensation coverage is as follows:

1. 75% of earnings based on a maximum of $5,600.00 per year.
2. To a dependent widow, $100.00 per month.
3. To a dependent child under the age of 18 years, $45.00 per month.
4. To a dependent invalid child of any age, $45.00 per month.

## 9B–2.1. – WAGES AND SALARIES

Labour costs North of 60 vary widely. Wage and salary levels on the Arctic Islands and the coastal regions may range up to 20% higher than the levels for similar jobs in the more accessible areas.

Following is a table of labour costs based on estimated wage and salary levels for a projected mining operation in an isolated region of the mainland. Of course, costs depend on the actual location and type of operation being planned.

In addition to these direct labour costs many northern mining companies provide free or low-cost housing, heat, power and water, and in some cases subsidized vacation travel expenses.

| Job Classification | Grade | Wage/Salary/Rate ($'s) |
|---|---|---|
| **Wage Classes** | | |
| Tractor operator | 1 | 3.20/hour |
| | 2 | 3.05/hour |
| Shovel operator | 1 | 3.80/hour |
| | 2 | 3.20/hour |
| Truck driver | 1 | 3.20/hour |
| | 3 | 2.80/hour |
| Driller | 1 | 3.25/hour |
| | 4 | 2.80/hour |
| Labourer | – | 2.55/hour |
| Crushing, grinding operator | 1 | 3.05/hour |
| | 3 | 2.80/hour |
| Flotation operator | 1 | 3.25/hour |
| | 2 | 3.05/hour |
| Heavy duty instrument mechanic | 1 | 3.80/hour |
| | 3 | 3.20/hour |
| Welder | 1 | 3.55/hour |
| | 3 | 3.15/hour |
| General maintenance | 1 | 3.05/hour |
| | 2 | 2.80/hour |
| Electrician | 1 | 3.60/hour |
| | 4 | 2.70/hour |
| Sampler | – | 2.85/hour |
| Carpenter | 1 | 3.50/hour |
| | 4 | 2.70/hour |
| Janitor | – | 2.55/hour |

**Salary Classes**

| | | |
|---|---|---|
| General Manager | – | 1800/month |
| Resident Manager | – | 1500/month |
| Personnel Officer | – | 800/month |
| Secretaries | 1 | 430/month |
| | 2 | 360/month |
| Clerk | 1 | 430/month |
| | 2 | 360/month |
| Accountant | 1 | 550/month |
| Geologist | 1 | 1250/month |
| | 3 | 675/month |
| Mine mechanical mill Supt. | – | 1150/month |
| Mine, etc. foreman | – | 750/month |
| Chief engineer | – | 1250/month |
| Mine engineer | – | 800/month |
| Surveyor | – | 525/month |
| Chief metallurgist | – | 950/month |
| Assayer | 1 | 650/month |
| | 2 | 550/month |
| Purchasing agent | – | 750/month |
| Warehouseman | 1 | 600/month |
| | 2 | 400/month |
| Medical doctor | – | 1700/month |
| Nurse | – | 550/month |
| Recreation Director | – | 750/month |

## 9B–2.1.1 – LABOUR LEGISLATION

The Yukon Labour Standards Ordinance sets out the following:

a) Minimum wage $1.25 per hour.

b) Hours of work: 8 hours in the day, and 44 hours in the week, for work performed in a shop – that is, an establishment which dispenses goods or services to the public at retail – or 8 hours in the day, and 48 hours in the week, in all other establishments.

c) Overtime. Overtime may be worked up to a maximum of 10 hours per day for which time and one-half must be paid. Any overtime requirement over a 10-hour day must have special permission from the Labour Standards Office.

d) General holidays. The Ordinance lists 9 statutory holidays. Any employer requiring an employee to work on any one of these holidays must pay that employee two and one-half times the normal rate of pay. Employees that are not required to work and do not work on these holidays, must be paid straight time.

e) Annual vacations. The Ordinance sets out an annual vacation for all employees of two weeks at the end of the first and each subsequent year. All employees must be paid 4% of gross pay, including overtime, in lieu of annual vacation, on termination.

f) Advisory Board. The Ordinance provides for an Advisory Board which may advise the Commissioner on various matters pertaining to labour which have been referred to the Board.

## 9B–3.1. – UTILITIES

### 9B–3.1.1 Power

The major power project currently being undertaken is the construction of a power line (138 kv) from Whitehorse to Faro (Anvil townsite) in the Yukon Territory. The Whitehorse power generation (thermal and hydro) capacity is simultaneously being raised to meet the increased demand for power.

A study of the hydro-electric power resources in the central Yukon Territory has recently been completed. Similar studies have recently been commissioned for the Coppermine and southern Great Slave Lake regions of the NWT.

Generally speaking, there is little excess capacity in present Territorial hydro-electric plants. However, the Northern Canada Power Commission, a Crown corporation which plans (and in some cases operates) power generation facilities in Northern Canada has a very flexible policy towards power generation facilities. This was demonstrated in the Taltson River hydro-electric scheme, primarily built to meet the power requirements of Pine Point Mines Ltd., on the south shore of Great Slave Lake. The scheme, with a generating capacity of 18,000 kilowatts, is located on the Taltson River some 35 miles northeast of Fort Smith, NWT. Power is being supplied to Pine Point by means of a 170 mile transmission line (115 kv). At present, Pine Point Mines Ltd. requires 11,000 kilowatts of power, but expansion of the mine/mill operations will require an additional 2,000 kilowatts. At present, then, excess capacity available for new purposes is around 5,000 kilowatts. Recently, the Northern Canada Power Commission stated that preliminary investigations indicated that around 50,000 kilowatts could be generated in the area by extending the present scheme.

Voltage of Territorial power lines varies from 34 kv to 138 kv, the actual voltage depending on transmission load and distance.

Rates for electric power supplied to relatively large industrial users in the Territories range from about 0.6-2.0 cents per kilowatt hour. The actual rate charged depends on location, quantity of power required, transmission distance, and pattern usage.

The following are examples of industrial power costs at various points North of 60.

| Location | Rate (¢ per kwh) |
|---|---|
| Yellowknife, N.W.T. | |
| (1960 – 4 megawatt capacity) | 1.50 |
| (1968 – 20 " " ) | 0.85 |
| Pine Point, N.W.T. | |
| (1968 – 25 megawatt capacity) | 1.10 |
| ( 35 " " ) | 0.90 |
| ( 50 " " ) | 0.60 |
| Coppermine, N.W.T. | |
| (Preliminary investigation) | 1.50 |

| Location | Rate (¢ per kwh) |
|---|---|
| Frobisher Bay, N.W.T. (Preliminary investigation) | 2.75 |
| Anvil, Y.T. (1969 – expected rate) | 1.00 |
| Clinton Creek, Y.T. (Preliminary investigation) | 1.75 |

For further information write:

Northern Canada Power Commission
251 Bank Street,
Ottawa, Ontario.

**9B–3.1.2 – Fuel Oil**

The prime source of electricity and heat North of 60 is fuel oil. When used in small quantities, for heating or diesel electric generating systems, it is normally handled in 45 gallon drums. Transportation of drums in the Territories is expensive, and wherever possible, bulk storage tanks have been constructed where a reasonable quantity of fuel oil is being used.

Under a Regional Price Agreement, the Hudson's Bay Company acts as the retailing distributor, an arrangement which has resulted in cheaper oil in the isolated areas. In addition, individual arrangements have been made with oil companies at other locations to act as agents.

Departmental tanks are located, by region:

| | |
|---|---|
| Region A | Coppermine<br>Spence Bay |
| Region B | Eskimo Point<br>Rankin Inlet<br>Whale Cove<br>Baker Lake<br>Chesterfield Inlet<br>Igloolik<br>Coral Harbour |
| Region C | Sugluk<br>Cape Dorset |
| Region D | Pond Inlet<br>Pangnirtung |

Fuel oil in the Yukon is supplied to Whitehorse from Pacific tidewater at Skagway through a four-inch pipeline, and from Whitehorse to other Yukon points by tank truck. The pipeline and trucking operations are controlled by the White Pass and Yukon Railway.

## TABLE 9B-1

### Commercial Energy Producing Installations In the Yukon and Northwest Territories

| Location | Agency | Type | Installed Capacity |
|---|---|---|---|
| **Yukon** | | | |
| Whitehorse | Y.E.C.L.[1] | Hydro | 1,650 Kw |
| Whitehorse | N.C.P.C.[2] | Hydro | 19,000 Kw |
| Whitehorse | N.C.P.C.[2] | Thermal | 9,000 Kw |
| Mayo | N.C.P.C.[2] | Hydro | 4,500 Kw |
| Dawson | N.C.P.C.[2] | Thermal | 750 Kw |
| Watson Lake | Y.E.C.L. | Thermal | 1,480 Kw[3] |
| Carmacks | Y.E.C.L. | Thermal | 450 Kw |
| Destruction Bay | Y.E.C.L. | Thermal | 500 Kw |
| Haines Junction | Y.E.C.L. | Thermal | 400 Kw |
| Teslin | Y.E.C.L. | Thermal | 500 Kw |
| Beaver Creek | Y.E.C.L. | Thermal | 310 Kw |
| Swift River | Y.E.C.L. | Thermal | 200 Kw |
| Ross River | Y.E.C.L. | Thermal | 260 Kw |
| Old Crow | Y.E.C.L. | Thermal | 150 Kw |
| Stewart Crossing | Y.E.C.L. | Thermal | 100 Kw |
| Pelly River | Y.E.C.L. | Thermal | 100 Kw |
| **NWT** | | | |
| Hay River | N.U.[4] | Thermal | 2,475 Kw |
| Enterprise | N.U. | Thermal | 150 Kw |
| Fort Provindence | N.U. | Thermal | 150 Kw |
| Yellowknife | N.C.P.C. | Hydro | 13,000 Kw |
| Fort Smith | N.C.P.C. | Thermal | 2,250 Kw[5] |
| Fort Simpson | N.C.P.C. | Thermal | 1,100 Kw |
| Inuvik | N.C.P.C. | Thermal | 4,500 Kw |
| Fort McPherson | N.C.P.C. | Thermal | 750 Kw |
| Fort Resolution | N.C.P.C. | Thermal | 325 Kw |
| Frobisher Bay | N.C.P.C. | Thermal | 4,000 Kw |
| Aklavik | N.C.P.C. | Thermal | 470 Kw |

TABLE 9B-1 continued

| Location | Agency | Type | Installed Capacity |
|---|---|---|---|
| NWT (cont'd) | | | |
| Taltson | N.C.P.C. | Hydro | 18,000 Kw[6] |
| Coppermine | N.C.P.C. | Thermal | 600 Kw |

1. Yukon Electrical Co. Ltd.
2. Northern Canada Power Commission
3. Will probably be connected to the 138 Kw. Anvil line in the near future.
4. Northland Utilities Ltd.
5. Standby plant only. Fort Smith receives power from the Taltson River hydro plant.
6. The Taltson hydro plant supplies power to Fort Smith, Pine Point Mines Ltd., and the town of Pine Point.

In the Mackenzie District of the Northwest Territories, the main supply is from the Imperial Oil refinery at Norman Wells. Oil from Norman Wells is transported almost entirely by barge along the Mackenzie River system, and by freighters along the Arctic Coast during the summer season. The Great Slave Lake region is supplied mainly by truck and rail service from Edmonton. Fuel oil and other petroleum for the Keewatin District and the eastern and northern Arctic Islands come from Venezuela.

Examples of fuel oil prices at various points, for industrial users (¢ per Imperial gallon):

| | |
|---|---|
| Frobisher Bay, NWT | 25¢ |
| Yellowknife, NWT | 30¢ |
| Whitehorse, YT | 25¢ |
| Dawson, YT | 35¢ |

Heavy fuel oil is available from Norman Wells. It has been estimated that this grade of oil could be supplied to points on Great Slave Lake at about 16¢ per gallon.

**9B–3.1.3 – Gasolines and Gas**

Distribution of gasoline and gas (natural or liquefied petroleum) follows a similar pattern to fuel oil.

In the Yukon, the products are carried to Whitehorse by the White Pass and Yukon Railway, and by truck from Whitehorse.

In the Northwest Territories, the Mackenzie District is supplied by Norman Wells. Eastern seaboard refineries supply the Keewatin District and the Arctic Islands.

Examples of gasoline prices for industrial consumers (¢ per Imperial gallon):

| | |
|---|---|
| Frobisher Bay, NWT | 47¢ |
| Yellowknife, NWT | 50¢ |
| Whitehorse, YT | 50¢ |
| Dawson, YT | 60¢ |

While natural gas has been discovered North of 60, as yet there are no natural gas pipelines supplying Territorial points. However, recent studies have indicated the wellhead price for natural gas at southern Territorial wells would average 12-16¢ per 1,000 cubic feet. If this gas were transported by pipeline 200 miles, the cost would average 10¢ per 1,000 cubic feet (20,000,000 cubic feet per day) to 25¢ per 1,000 cubic feet (5,000,000 cubic feet per day).

## INDEX

## TERRITORIAL GOVERNMENT "C"



Revised April, 1971.

# TERRITORIAL GOVERNMENT

## 9C–1.1 – GENERAL

The evolution of government in the Yukon and the Northwest Territories continues to keep pace with the economic development of the two regions. As the population grows, as the indigenous peoples assume greater responsibilities in their communities, and as economic development brings greater prosperity and opportunities, the degree of local participation increases. The Federal Government has overriding jurisdiction North of 60 and is sponsoring a gradual transition from Federal to Territorial government responsibility and administration.

The Territorial Governments are unique in many ways. In both Territories, the Commissioner is appointed by the Federal Government, the control of certain government fields is retained by the Federal Government, and the Federal Government still holds considerable control over Territorial legislation and meets the bulk of the cost of these northern governments.

A main area in which direct control has been retained by the Federal Government is the field of natural resources. Exceptions in the case of natural resources are found in game and land surrounding communities and settlements which are under the jurisdiction of the Territorial Governments.

Under the division of responsibilities between the Federal and Territorial Governments, most of the Territorial ordinances are administered by the Territorial public services of the Yukon and increasingly so in the Northwest Territories. Some are administered by agencies of the Federal Government.

Federal administration covers such fields as Public Health Ordinances and Regulations, the Mining Safety Ordinance and the Blasting Ordinance. Also, the Minister of Justice for Canada is the Attorney General of the two Territories and the responsibility for the administration of justice remains in Federal hands. The Federal Government also administers its own legislation with respect to the resource field.

### 9C–1.1.1. – Advisory Committee on Northern Development

The Advisory Committee on Northern Development was established by the Federal Government to consider and report periodically on all phases of development of the Canadian North. The reports of the Committee cover the operations of all the various Federal Government departments, agencies and Crown corporations active in the Territories. The Committee also outlines future plans. Copies of the Committee reports may be obtained from:

Advisory Committee on Northern Development,
Centennial Tower Building,
400 Laurier Ave. W.,
Ottawa 4, Ontario,
Canada.

Committee membership includes the following senior government officers:

The Deputy Minister of Indian Affairs
and Northern Development (Chairman)
Deputy Minister of Agriculture
Deputy Minister of Supply and Services
Deputy Minister of National Defence
Chief of the Defence Staff
Chairman, Defence Research Board
Deputy Minister of Energy, Mines and Resources
Under-Secretary of State for External Affairs
Deputy Minister of Public Works
Deputy Minister of Finance
Deputy Minister of Fisheries and Forestry
Deputy Minister of Manpower and Immigration
Deputy Minister of National Health and Welfare
President, National Research Council
Clerk of the Privy Council and Secretary to the Cabinet
Commissioner, Royal Canadian Mounted Police
Deputy Minister of Transport
Secretary of the Treasury Board
Deputy Minister of Communications
Chief Science Adviser to the Cabinet
Commissioner of the Yukon Territory
Commissioner of the Northwest Territories
The Secretary, Advisory Committee on Northern Development

In addition, four permanent sub-committees function under the direction of the main Committee. These are:

Co-ordinating Sub-Committee
Transportation Sub-Committee
Scientific Research Sub-Committee
Communications Sub-Committee

**9C–1.1.2 – Territorial Representation**

Both the Yukon and Northwest Territories send one elected representative to the Federal Parliament in Ottawa.

**9C–1.1.3 – Local Government**

The development of local governments is actively encouraged in both Territories and, in both Territories, specific departments have been established to foster, encourage, and assist in this matter. Some communities already have a well-established local government responsible for the normal operation and systematic development of their areas.

## 9C–2.1 – THE YUKON TERRITORY

The basic legislation providing for the Government of the Yukon Territory is the Yukon Act. It provides for a Commissioner to administer the government of the Territory under instructions issued from time to time by the Governor in Council or the Minister of Indian Affairs and Northern Development. In 1970 an Executive Committee was established consisting of the Commissioner, the two Assistant Commissioners and two members of the Territorial Council chosen by the Council. In addition to their responsibilities as members of the Executive Committee the two elected representatives administer certain Departments of the Territorial Government.

The Legislative Council of the Yukon consists of seven members elected from constituencies throughout the Territory. The Members are elected for a four-year term of office unless the Council is previously dissolved by the Governor in Council (Federal Cabinet). The Council is presided over by one of its own members who is chosen as Speaker at the beginning of each four-year term.

The legislative powers of the Commissioner in Council are roughly analogous to those of a provincial Legislative Assembly. Under the terms of the Yukon Act, these powers include legislation in the following fields of jurisdiction.

Direct taxation

Territorial offices and municipal institutions

Election of the members of the Council

Occupation or Business licences

Company incorporation

Marriage laws

Property and civil rights

Administration of justice

Game laws

Education

Control of intoxicants

Hospitals

Welfare

Agriculture

Expenditures from the Yukon Consolidated Revenue Fund

Fines, penalties, imprisonment

Other local and/or private matters within the terms of the Act

Legislation passed by the Council may be disallowed by the Governor in Council within one year of its passage. Unlike the situation in the provinces the legislative powers of the Council are derived from the Parliament of Canada and may be changed from time to time.

**9C–2.1.1 – Public Service**

The Public Service of the Yukon is separate and distinct from the Federal Public Service. It is divided into major departments with the following general areas of responsibility:

Administrative Services:

- Personnel
- Central Purchasing and Inventory Control
- Central Registry
- Legal
- Housing and Accommodations
- General Printing and Stationery

Financial and Accounting Services:

- Accounting
- Estimates
- Payroll
- Revenue
- Expenditures
- Internal Audit
- Budget Control
- Hospital Insurance

Territorial Secretary:

- Enforcement of ordinances
- Public Administrator
- Liquor
- Labour
- Registrar of Companies
- Inspection

Engineering and Municipal Services:

- Administration
- Mechanical
- Vehicle and Equipment Pool
- Road Maintenance
- Buildings
- Projects
- Municipal Affairs
- Assessments

Education and Vocational Training:

- Primary Schools
- Secondary Schools
- Vocational and Technical Schools
- Administration

Welfare and Rehabilitation:

- Welfare
- Correction
- Probation

Health Services:

- Public Health Services
- Northern Health Services

Conservation and Recreation:

- Game Ordinances
- Library Services
- Travel and Publicity
- Fitness and Amateur Sport

The Territorial department heads are individually responsible for the administration of their department to the Commissioner.

## 9C–3.1 – NORTHWEST TERRITORIES

The Northwest Territories Act establishes and outlines the scope and powers of the Commissioner and the Legislative Council. In 1966 the Report of the Advisory Commission on the Development of Government in the Northwest Territories made recommendations for the development of government for the next ten years. Subsequently, the Federal Government implemented a number of the recommendations and established a series of Task Forces to study ways of implementing other recommendations.

Yellowknife was named the seat of government of the Northwest Territories in 1967 and Territorial Government employees began arriving in the town before the end of the year to commence taking over their duties. A Public Service for the Northwest Territories was established and the target date for the transfer to the Territorial Government of various programs, including education and welfare, was set for April 1, 1969 for the Mackenzie District and April 1, 1970 for the Eastern Arctic.

The Northwest Territories Act provided partial representative government but not responsible government for the Territories. Executive authority is placed in the Commissioner who is appointed by, and who is responsible to, the Federal Government. The Legislative Council is composed of ten elected and four appointed members. The elected members represent the constituencies throughout the whole of the Territories and the Commissioner presides over the Council in session. All Council Members serve for a term of three years. Like the Yukon Act, the Northwest Territories Act provides a wide range of legislative power to the Commissioner in Council. It established a full system of courts and authorizes a Northwest Territories Consolidated Revenue Fund.

### 9C–3.1.1 – The Public Service

The expanding Territorial Government is based upon seven major departments with supporting information, legal advisory, personnel, and management audit services. The major departments, along with their main responsibilities are:

Local Government:

Municipal Ordinance
Fostering, encouraging and assisting in the development of local government

Industry and Development:

Promoting and assisting industrial development, tourism, game administration

Department of Social Development:

Corrections Service
Family Services and Child Welfare
Rehabilitation and Medical Services
Alcohol Education

Department of Education:

School Services
Adult Education
Curriculum Development

Territorial Treasury:

Accounting, financial and treasury functions of the Territorial Government
Liquor

Territorial Secretary:

Council Secretariat
Provides services of an administrative and technical nature to all elements of the headquarters organization.
Licensing

Department of Public Works:

All aspects of public works operations including design, construction and maintenance of roads, buildings and municipal-type services.

## 9C–4.1 – GOVERNMENT SERVICES

### 9C–4.1.1 – Housing

The type, size and number of houses provided in a community often has a far-reaching effect on the social and economic development of that community. For this reason all levels of government concern themselves with housing North of 60. In particular, the Territorial Governments are taking an increasingly active part in the development of housing in their regions.

The Central Mortgage and Housing Corporation (CMHC) is a Crown agency and, as such, is responsible for the administration of the National Housing Act and co-ordination of the activities of the Federal Government in the housing for all of Canada. The present National Housing Act is defined as an act "to promote the construction of new houses, the repair and modernization of existing houses and the improvement of housing and living conditions". The Corporation has the authority and responsibility for a variety of functions affecting housing in both the long term and the immediate future. It is empowered to act as an insurer of mortgage loans, as a lender or investor of public funds, as a guarantor and as an owner of property and other assets. It also acts as a research agency in fields associated with housing and assists provinces, the Yukon and Northwest Territories and municipalities in many aspects of urban growth.

In general, the Federal Government, through the successive housing acts, has attempted to stimulate and supplement the market for housing rather than assume direct responsibilities that rightfully belong to other levels of government or that could be borne more effectively by private enterprise. In each case the aim has been to increase the flow of mortgage money and to encourage lenders to make loans on more favourable terms to home owners.

A second mortgage plan has been introduced by the governments of the Yukon and Northwest Territories as a supplement to amounts available under the National Housing Act. This plan is designed to assist those who qualify for a first mortgage under the Act but because of the higher costs of construction in the North, need additional assistance. This program is administered by CMHC on behalf of the Territorial Governments.

In the Yukon, CMHC has established an office in Whitehorse to improve its lending facilities and provide a more direct advisory service to the Territorial Government. Regular consideration of housing problems and needs in the Yukon is given by joint meetings of the Territorial Government with representatives of the Department of Indian Affairs and Northern Development and officials of CMHC

Both the governments of the Yukon and the Northwest Territories provide first mortgage loans for residents constructing low-cost houses. In addition, the mortgagee under this program may be given a second mortgage which is forgivable over a period of ten years.

Recent legislation in the Northwest Territories has been enacted by the Territorial Government in the form of the Housing Development Ordinance which complements the National Housing Act and which is intended "to promote the improvement of housing and living conditions in the Northwest Territories". The Ordinance provides for the Commissioner or a municipality with the approval of the Commissioner to enter into agreements with CMHC to undertake and operate public housing projects, to acquire and develop land for housing purposes, to prepare and implement urban renewal schemes, to undertake student housing projects and to construct sewage treatment projects. As a result of the legislation the Territorial Government has requested CMHC to participate in public housing, land assembly, urban renewal projects as well as construction of rental housing in Yellowknife, Hay River, Inuvik and Fort Smith. CMHC has opened an office in Yellowknife.

Special assistance programs in the form of low-rental housing have been introduced by the Federal Government and by the Government of the Northwest Territories to deal with the housing needs of the low income indigenous families.

The Territorial Governments are actively interested in the growth of the North and recognize that an economy cannot develop properly unless it is accompanied by reasonably permanent settlements. This goal can never be obtained without adequate housing. The housing programs in effect at present have been introduced in the belief that they will assist economic growth both by providing a fund to finance home ownership and by supplying low-rental accommodation to those people not able to purchase housing and by encouraging the use of local resources wherever feasible.

### 9C–4.1.2 – Health

Because of the special problems in developing health services North of 60, the Department of National Health and Welfare has been given the responsibility of co-ordinating federal and territorial health care for all residents. In this role the Department assists the Territorial Governments in providing public health services. Health facilities range from modern hospitals to lay dispensaries operated by a trader, policeman or missionary at some very remote settlements. Although there are several doctors in private practice, along with Territorial, community and church operated hospitals in some settlements, most facilities and staff elsewhere in the Yukon and Northwest Territories are supplied by the Northern Health Service of the Department. The object of both the Federal and Territorial Governments is to ensure that medical and other health services, comparable to those in other parts of Canada, are available to residents North of 60.

The overall problem of health service in the North is to provide health care with a limited number of staff to comparatively small groups of people scattered over more than 1,000,000 square miles.

### 9C–4.1.3 – Welfare

The programs of social welfare in effect North of 60 are aimed at making available social welfare benefits which not only reflect the special needs of the northern people but at the same time are comparable in scope and quality to those available in southern Canada. Northern Canadians receive aid in the same manner and same amounts as other residents of Canada under federal programs such as family allowances, old age security, old age assistance and blind and disabled persons' allowances. In addition, there are programs for neglected children, homes for the aged, medical social services especially for problems relating to the hospitalization of Indians and Eskimos and a social assistance program providing food, clothing and shelter to those who are in temporary financial distress.

Community Welfare Services constitute a series of programs designed to assist communities and groups rather than individuals in meeting the type of complex problem mentioned above.

The Community Development Fund, a means of stimulating community initiative and reducing local unemployment, has enabled a number of communities to undertake a variety of useful projects that originate locally and are carried out under local responsibility.

These include projects such as community bath houses and renovations to community halls. A comprehensive corrections program has been developed and it includes the construction of territorial prisons, minimum security camps and juvenile detention units. The program makes extensive use of probation as well as after-care service and incorporates the most advanced principles of corrections to achieve maximum rehabilitation of prisoners.

**9C–4.1.4 – Education**

The school system in the Yukon is operated by the Territorial Government through a superintendent or director and staff responsible to the Commissioner. With the exception of three school districts in the Northwest Territories, all schools are government owned. Wherever possible, classrooms and teachers are provided locally to meet community education needs but because of distance and small populations this arrangement is not always possible. Pupil residence facilities have been established at larger centers (mainly in the Northwest Territories for secondary or vocational pupils) to accommodate students from distant points.

An extensive system of special education programs has been set up to meet the needs of the local people. They include vocational and apprenticeship training programs in addition to normal primary and secondary schooling. Also, adult education is available to provide the educational training and guidance which adults require to face the complex social, economic and cultural problems they encounter in their rapidly changing environment. Where necessary, North of 60 residents may be sent to educational institutions in the provinces, if appropriate training courses are not available in the North.

University level education facilities are not available in the Territories but attendance may be arranged for, and financial assistance provided to, individuals meeting the entrance prerequisites of Canadian universities.

## INDEX

## MUNICIPALITIES "D"

# MUNICIPALITIES

## 9D–1.1 – YUKON

The main communities of the Yukon Territory:

### 9D–1.1.1 – Whitehorse

| | |
|---|---|
| Population: | City 4,771. Metropolitan area 9,000. (1966 census) |
| Location: | On Yukon River, 900 miles northwest of Vancouver, B.C., 390 miles south of Arctic Circle. |
| Municipal Status: | Capital of the Yukon Territory. Governed by elected council composed of mayor and four councillors. |
| Federal Agencies: | Department of Transport.<br>Yukon RCMP headquarters.<br>Office of Mining Recorder, Whitehorse district. |
| Services: | Fire department.<br>Police.<br>Hospital (120 beds). |
| Utilities: | Power – Yukon Electrical Company,<br>Northern Canada Power Commission.<br>Water – City of Whitehorse.<br>Sewerage – City of Whitehorse. |
| Schools: | Vocational and technical training centre, primary, high and separate schools. |
| Churches: | Anglican Church of Canada.<br>Roman Catholic Church. |
| Transportation: | Rail – White Pass and Yukon Route to Skagway, Alaska.<br>Air – Modern airport capable of handling jet transports, Radio range, meteorological stations. Scheduled airlines to Seattle, Vancouver, Edmonton, Fairbanks.<br>Road – Alaska Highway to southern Canada and Alaska.<br>Water – Local water transport on Yukon River. |
| Communications: | Mail, telephone, telegraph, radio and television facilities. Newspapers, "Yukon Daily News", Whitehorse Star Weekly". |
| Public Facilities: | Community centre, hotels, motels, banks, theatre, stores, and other community facilities. |

**9D–1.1.2 – Dawson**

| | |
|---|---|
| Population: | 742 (1966). |
| Location: | On the Yukon and Klondike Rivers, 388 road miles northwest of Whitehorse. |
| Municipal Status: | An incorporated municipality governed by an elected council composed of mayor and three councillors. |
| Federal Agencies: | Department of Transport.<br>Mining Recorders Office.<br>Forestry Office.<br>RCMP. |
| Services: | Nursing station.<br>Home for retired miners. |
| Utilities: | Power – Northern Canada Power Commission.<br>Water – Northern Canada Power Commission.<br>Sewerage – Municipality of Dawson. |
| Schools: | Public elementary and high school.<br>Roman Catholic elementary and highschool. |
| Churches: | Anglican, Roman Catholic, Pentecostal Tabernacle, Jehovah Witness. |
| Transportation: | Scheduled flights to and from Whitehorse. Regular bus service to and from Whitehorse. Sixty Mile Road open during summer months only between Dawson and Alaskan border. Local water transport. |
| Communications: | Regular mail, telephone, telegraph, radio services, weekly newspaper. |
| Public Facilities: | Hotels, motels, stores, banks, restaurants, historic Palace Grand Theatre restored as National Historic Site. |

**9D–1.1.3 – Watson Lake**

| | |
|---|---|
| Population: | 735 (1966). |
| Location: | 220 miles southeast of Whitehorse. |
| Municipal Status: | Local improvement district. |
| Federal Agencies: | Department of Transport.<br>Yukon Forest Service.<br>Mining Recorders Office.<br>RCMP.<br>Department of National Health and Welfare. |

| | |
|---|---|
| Services: | Hospital (10 beds).<br>Fire department.<br>Police. |
| Utilities: | Power – Northern Canada Power Commission.<br>Sewer system. |
| Schools: | Elementary and secondary public schools. |
| Churches: | Anglican Church of Canada.<br>Roman Catholic Church.<br>Pentecostal Tabernacle.<br>Baptist Church. |
| Transportation: | Air – Scheduled airline services to Whitehorse, Edmonton, Vancouver.<br>Road – Alaska Highway connections to Edmonton, Whitehorse, B.C. interior. |
| Communications: | Telephone, telegraph, radio facilities. |
| Public Facilities: | Hotels, motels, restaurants, theatre, and other community services. |

## 9D–2.1 – NORTHWEST TERRITORIES

### 9D–2.1.1 – Yellowknife

| | |
|---|---|
| Population: | 3,741 (1966). |
| Location: | On west shore of Yellowknife Bay, Great Slave Lake. |
| Municipal Status: | Capital of the Northwest Territories. Government by council composed of mayor and eight councillors. |
| Federal Agencies: | Department of Indian Affairs and Northern Development.<br>Department of Energy, Mines and Resources.<br>Department of Justice.<br>Department of Manpower and Immigration – Canada Manpower Centre.<br>Department of National Health and Welfare.<br>Department of Public Works.<br>Department of Transport. |
| Services: | Fire department.<br>Police.<br>Hospital (43 beds). |
| Utilities: | Power – Northern Canada Power Commission.<br>Water – Town of Yellowknife.<br>Sewerage – Town of Yellowknife. |
| Schools: | Public and separate elementary and high schools.<br>Composite academic-vocational school operated by Department of Indian Affairs and Northern Development. |
| Churches: | Anglican Church of Canada.<br>United Church of Canada.<br>Roman Catholic Church.<br>Baptist Church.<br>Pentecostal Tabernacle,<br>Bahai World Faith |
| Transportation: | Air – Modern airport. Scheduled flights to Edmonton, points north, Churchill, Winnipeg.<br>Road – Yellowknife highway to southern Canada. Regular bus service to Edmonton.<br>Water – Lake transport service. |
| Communications: | Regular mail, telephone, telegraph, radio and television services.<br><br>Newspaper, "News of the North" |
| Public Facilities: | Hotels, banks, stores, theatres, golf course, and other community facilities. |

**9D–2.1.2 – Inuvik**

| | |
|---|---|
| Population: | 3000 (1966). |
| Location: | East channel of the Mackenzie River Delta, 60 miles south of Beaufort Sea and 125 miles north of Arctic Circle. |
| Municipal Status: | Village. |
| Federal Agencies: | Department of Indian Affairs and Northern Development (Northern Administration Branch, Indian Affairs Branch, Canadian Wildlife Service, Northern Coordination and Research Centre.)<br>Department of National Defence.<br>Department of National Health and Welfare.<br>Department of Public Works.<br>Department of Transport.<br>RCMP. |
| Services: | Fire department.<br>Hospital (100 beds).<br>Police. |
| Utilities: | Power, water, heat provided by Northern Canada Power Commission. |
| Schools: | Elementary and secondary schools operated by Department of Indian Affairs and Northern Development. |
| Churches: | Anglican Church of Canada.<br>Roman Catholic Church.<br>Pentecostal Inuvik Christian Assembly.<br>Church of Latter Day Saints. |
| Transportation: | Air – modern airport. Scheduled flights to Edmonton and intermediate stops. Non-Scheduled flights to Yukon and Arctic points.<br>Water – Barge service along Mackenzie River waterway.<br>Road – 25 miles of local roads. |
| Communications: | Mail, telephone, telegraph, radio facilities. Weekly newspaper, "The Drum," printed in English, Eskimo and Indian. |
| Public Facilities: | Hotels, stores, banks, restaurants, laundry and dry-cleaning establishment operated by Department of Indian Affairs and Northern Development, and other community services. |

**9D–2.1.3 – Fort Smith**

| | |
|---|---|
| Population: | 2,200 (1966). |

| | |
|---|---|
| Location: | On west bank of Slave River, one mile north Alberta – NWT border, 450 miles north of Edmonton. |
| Municipal Status: | Town |
| Federal Agencies: | Department of Indian Affairs and Northern Development.<br>Department of Transport.<br>District Treasury Office, Department of Finance.<br>Department of National Health and Welfare.<br>Department of Public Works.<br>RCMP. |
| Services: | Fire department.<br>Hospital.<br>Clinic.<br>Police. |
| Utilities: | Power – Northern Canada Power Commission.<br>Water – Town of Fort Smith.<br>Sewerage – Town of Fort Smith. |
| Schools: | Public elementary and high school.<br>Grandin College for promising older students. |
| Churches: | Roman Catholic Church. Site of Roman Catholic Mission and seat of the Roman Catholic Vicariate Apostolic of Mackenzie.<br>Anglican Church of Canada.<br>Pentecostal Tabernacle.<br>Baptist Church. |
| Transportation: | Air – regular scheduled flights to Yellowknife, Edmonton, Uranium City, Prince Albert, Sask.<br>Road – Highway connections to Pine Point, Hay River and Mackenzie Highway system.<br>Water – Trans-shipment centre on Mackenzie River system. |
| Communications: | Mail, telephone, telegraph, radio facilities. Weekly newspaper, "The Norther." |
| Public Facilities: | Hotels, banks, stores, community centre, library, golf course, skiing. |

**9D–2.1.4 – Hay River**

| | |
|---|---|
| Population: | 2004 (1966) |
| Location: | At mouth of Hay River on south shore of Great Slave Lake. |
| Municipal Status: | Town |

9D–2.1.4

| | |
|---|---|
| Federal Agencies: | Department of Indian Affairs and Northern Development.<br>Department of Public Works.<br>Department of Fisheries.<br>Department of Transport.<br>RCMP. |
| Services: | Fire department.<br>Hospital.<br>Health Centre.<br>Police. |
| Utilities: | Power – Northland Utilities Limited.<br>Water, sewerage, garbage collection. |
| Schools: | Public and separate elementary and high schools. |
| Churches: | Anglican Mission<br>Roman Catholic Mission.<br>United Church of Canada.<br>Pentecostal Chapel. |
| Transportation: | Air – regular service to Edmonton, Yellowknife, Peace River, Fort Smith.<br>Road – Mackenzie Highway to southern Canada and Yellowknife. Regular bus service.<br>Rail – Northern terminus of Great Slave Lake Railway.<br>Water – Great Slave Lake and Mackenzie River transport service. |
| Communications: | Mail, telephone, telegraph, radio facilities. Weekly newspapers, "TAPWE", "Hay River News". |
| Public Facilities: | Hotels, restaurants, banks, and other community facilities, arena, tourist camps. |

**9D–2.1.5 – Frobisher Bay**

| | |
|---|---|
| Population: | 1,651 (1966). |
| Location: | At head of Frobisher Bay on southeast corner of Baffin Island. |
| Municipal Status: | Unincorporated. |
| Federal Agencies: | Regional headquarters, Department of Indian Affairs and Northern Development.<br>Eastern Arctic sub-division headquarters, RCMP.<br>Department of Transport. |
| Services: | Hospital (30 beds).<br>Police. |

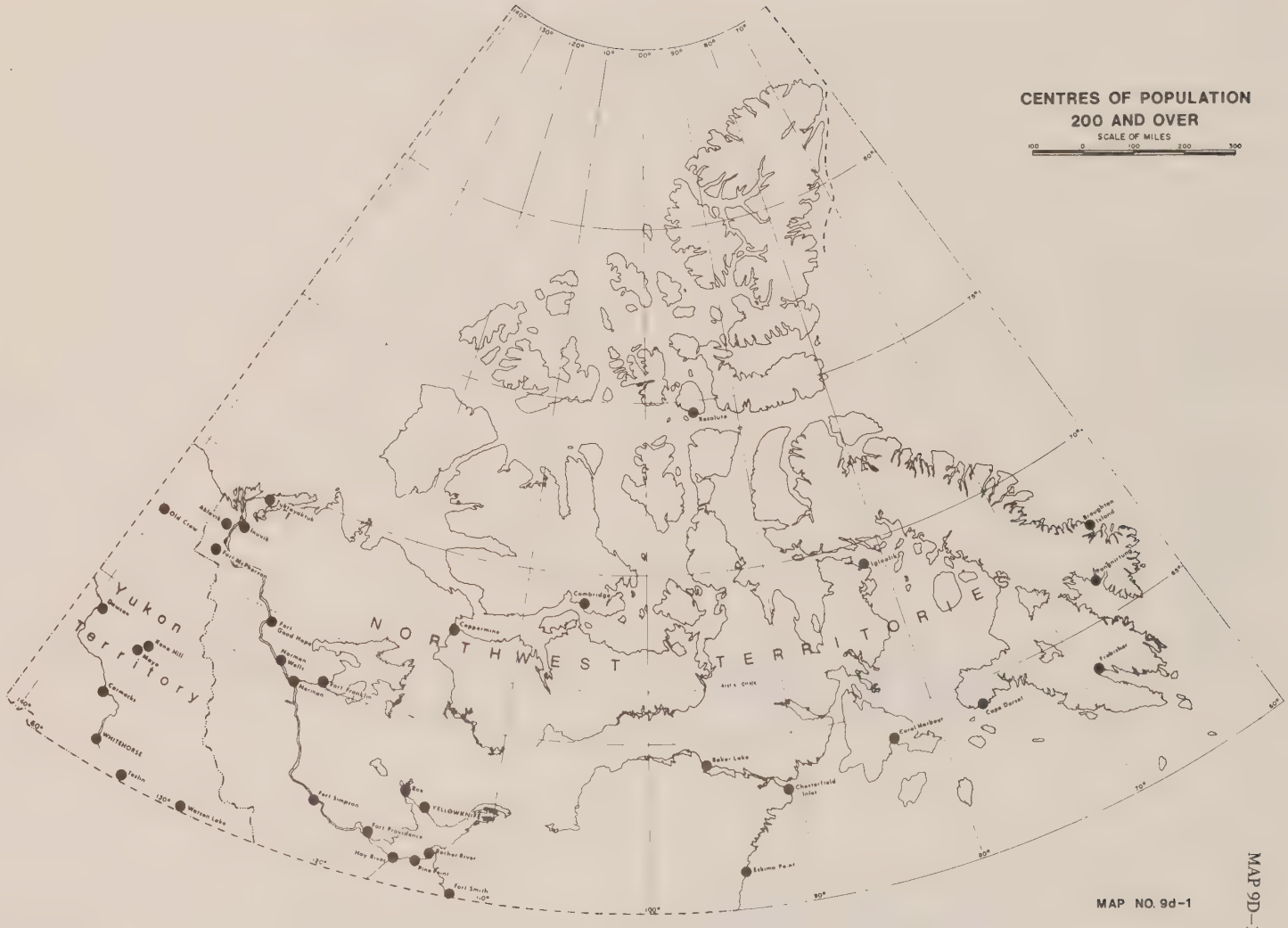
| | |
|---|---|
| Utilities: | Power – Northern Canada Power Commission diesel electric plant.<br>Water delivery, sewerage, garbage services under contract by Department of Indian Affairs and Northern Development. |
| Schools: | Federal day school. |
| Churches: | Anglican mission.<br>Roman Catholic mission. |
| Transportation: | Air – modern airport. Scheduled service to Montreal and Arctic points.<br>Water – major Arctic resupply base. |
| Communications: | Mail, telephone, telegraph, radio facilities. |
| Public Facilities: | Store, bank, local transportation facilities, theatre. |

**9D–2.1.6 – Baker Lake**

| | |
|---|---|
| Population: | 596 (1966) |
| Location: | 200 miles inland from west coast of Hudson Bay, Latitude 64°N, Longitude 96°W. |
| Municipal Status: | Unincorporated. |
| Federal Agencies: | Department of Indian Affairs and Northern Development.<br>Department of Transport.<br>RCMP Keewatin sub-division.<br>Department of National Health and Welfare.<br>National Research Council. |
| Services: | Nursing station (3 beds and clinic). |
| Utilities: | Local services provided. |
| Schools: | Federal day school. |
| Churches: | Roman Catholic Mission.<br>Anglican Mission. |
| Transportation: | Air – scheduled service to Churchill and points north.<br>Water – summer lake freight service. |
| Communications: | Mail, telephone, radio-telephone service. |
| Public Facilities: | Hudson's Bay Company northern store. |

**9D–2.1.7 – Cambridge Bay**

| | |
|---|---|
| Population: | 511 (1966). |
| Location: | On southeast tip of Victoria Island, 1150 miles northeast of Edmonton. |
| Municipal Status: | Unincorporated. |
| Federal Agencies: | Department of Indian Affairs and Northern Development.<br>Department of Transport.<br>RCMP. |
| Services: | Department of National Health and Welfare nursing station.<br>Police. |
| Utilities: | Water, sewage and garbage disposal provided under contract. |
| Schools: | Federal school and hostel. |
| Churches: | Anglican Church of Canada.<br>Roman Catholic Church. |
| Transportation: | Air – Scheduled airline service from Yellowknife, Edmonton.<br>Water – Summer sea lift service. |
| Communications: | Telephone, radio. |
| Public Facilities: | Hotel, supermarket, theatre, library, curling rink, social club. |


CENTRES OF POPULATION
200 AND OVER
SCALE OF MILES
100 0 100 200 300
Yukon Territory
NORTHWEST TERRITORIES
Old Crow
Aklavik
Inuvik
Fort McPherson
Dawson
Stewart
Keno
Carmacks
WHITEHORSE
Teslin
Watson Lake
Fort Simpson
Fort Providence
Hay River
Fort Smith
Parker River
Fort Franklin
Norman Wells
Fort Good Hope
Coppermine
Cambridge Bay
Resolute
Baker Lake
Chesterfield Inlet
Eskimo Point
Coral Harbour
Cape Dorset
Frobisher
Pangnirtung
Clyde River
Broughton Island
Arctic Circle

MAP NO. 9d-1

## TABLE 9D-1

### Population of Yukon Communities of 50 persons and over, 1961 and 1966

### Unincorporated Places of 50 persons and over

| Yukon Territory | 1966 | 1961 |
|---|---|---|
| Old Crow Village | 218 | 217 |
| Bear Creek | 87 | 138 |
| Calumet | 198 | 377 |
| Dominion | ... | 76 |
| Elsa | 529 | 395 |
| Keno Hill | 144 | 156 |
| Pelly Crossing | 137 | 151 |
| Sulphur | ... | 52 |
| Aishihik | 19 | 61 |
| Beaver Creek | 114 | 96 |
| Burwash Landing | 69 | 57 |
| Carmacks | 311 | 218 |
| Champagne | 28 | 56 |
| Destruction Bay | 64 | 104 |
| Haines Junction | 195 | 199 |
| Swift River | 40 | 50 |
| Upper Liard | 148 | 199 |
| Watson Lake | 631 | 597 |
| Carcross | 199 | 175 |
| Crestview Subdivision | 162 | ... |
| Porter Creek | 489 | ... |
| Ross River | 173 | 132 |
| Teslin | 324 | 231 |
| Total Unincorporated of 50 persons & over | 4,279 | 3,737 |
| Total Unincorporated of less 50 persons | 763 | 976 |
| Unorganized | 3,348 | 3,561 |

TABLE 9D-1 continued

| Yukon Territory | 1966 | 1961 |
|---|---|---|
| Cities | | |
| Dawson | 742 | 881 |
| Whitehorse | 4,771 | 5,031 |
| Towns | | |
| Mayo | 479 | 342 |
| Grand Total Yukon Territory | 14,382 | 14,628 |

(...) not shown separately

Source: D.B.S. Census of Canada 1961, 1966.

## TABLE 9D-1 continued

### Unincorporated Places of 50 persons and over

| Northwest Territories | 1966 | 1961 |
|---|---|---|
| Cape Dorset | 357 | 161 |
| Port Burwell | 105 | 36 |
| Mould Bay | 56 | ... |
| Cambridge Bay | 511 | 531 |
| Perry River | 71 | 14 |
| Holman Island | 179 | 98 |
| Read Island | ... | 75 |
| Sachs Harbour | 132 | 76 |
| Eskimo Point | 464 | 168 |
| Whale Cove | 181 | 125 |
| Baker Lake | 596 | 386 |
| Chesterfield Inlet | 199 | 146 |
| Daly Bay | 59 | ... |
| Rankin Inlet | 429 | 585 |
| Coral Harbour | 298 | 117 |
| Pelly Bay | 171 | 94 |
| Spence Bay | 247 | 124 |
| Belcher Islands | 178 | 169 |
| Bathurst Inlet | 73 | 23 |
| Fort Resolution | 677 | 485 |
| Pine Point | 459 | 1 |
| Rocher River | 38 | 58 |
| Discovery Mines | 159 | 203 |
| Lac La Martre | 125 | 121 |
| Marian Lake Village | 43 | 82 |

## TABLE 9D-1 continued

### Unincorporated Places of 50 persons and over

| Northwest Territories | 1966 | 1961 |
|---|---|---|
| Rae | 779 | 522 |
| Rae Lake | 53 | ... |
| Shoti Lake Camp | ... | 52 |
| Snare Lake | 56 | ... |
| Snowdrift | 176 | 140 |
| Tundra Mine | 65 | ... |
| Trout Rock | ... | 107 |
| Contowoyto Lake | 13 | 53 |
| Coppermine | 536 | 230 |
| Cape Parry | 50 | 214 |
| Tuktoyaktuk | 512 | 409 |
| Aklavik | 611 | 599 |
| Reindeer Depot | 76 | 77 |
| Arctic Red River | 86 | 87 |
| Fort McPherson | 654 | 509 |
| Colville Lake | 67 | 57 |
| Fort Good Hope | 335 | 292 |
| Fort Franklin | 311 | 238 |
| Fort Norman | 216 | 189 |
| Norman Wells | 199 | 297 |
| Fort Liard | 177 | 154 |
| Jean Marie River | 51 | 44 |
| Nahanni Butte | 71 | 76 |
| Tungsten | 198 | ... |

TABLE 9D-1 continued

Population of Northwest Territories Communities of 50 persons and over, 1961 and 1966

Unincorporated Places of 50 persons and over

| Northwest Territories | 1966 | 1961 |
|---|---|---|
| Repulse Bay | 146 | 116 |
| Gjoa Haven | 162 | 98 |
| Albert Harbour | 64 | ... |
| Arctic Bay | 123 | 49 |
| Cape Cunningham | 52 | ... |
| Clyde | 99 | 40 |
| Foxe Main | ... | 58 |
| Grise Fiord | 98 | 70 |
| Hall Beach | 100 | ... |
| Igloojuak | 53 | 15 |
| Igloolik | 328 | 133 |
| Kikitordjuak | 60 | 39 |
| Kingmitokvik | ... | 65 |
| Kipoyovik | 29 | 66 |
| Nedloa | ... | 50 |
| Pond Inlet | 178 | 53 |
| Resolute Bay | 254 | 153 |
| Bon Accord | 38 | 66 |
| Broughton Island | 201 | 70 |
| Imigen | 53 | 46 |
| Padloping Island | 62 | 43 |
| Pangnirtung | 376 | 114 |
| Frobisher Bay | 1,631 | 1,426 |
| Lake Harbour | 97 | 90 |

## TABLE 9D-1 continued

### Unincorporated Places of 50 persons and over

| Northwest Territories | 1966 | 1961 |
|---|---|---|
| Wrigley | 136 | 128 |
| Fort Providence | 378 | 402 |
| Total Unincorporated of 50 persons & over | 15,817 | 11,614 |
| Total Unincorporated of less than 50 persons | 1,765 | 2,839 |
| Unorganized | 3,293 | 2,281 |
| Towns | | |
| Hay River | 2,002 | 1,338[1] |
| Yellowknife | 3,741 | 3,245[1] |
| Villages | | |
| Fort Smith | 2,120 | 1,681[2] |
| | 28,738 | 22,998 |

Notes: [1]Municipal District

[2]Local Improvement District

... Not shown separately

Source: D.B.S., Census of Canada 1961 and 1966

## INDEX

## GEOGRAPHY AND CLIMATE "E"

# GEOGRAPHY AND CLIMATE

## 9E–1.1 – GENERAL

The Yukon and Northwest Territories comprise about one-third of the total area of Canada, covering 207,076 square miles in the Yukon and 1,253,438 square miles in the Northwest Territories. Consequently, there is considerable variation in climate and geography within the two regions.

Climate is a cost factor in any planned activity in the Territories, but in many activities, such as mining, it is not a physical barrier. Mines have been operating successfully on a year-round basis at such points as Yellowknife and Port Radium for many years. Construction is carried on very successfully, by men and machines, during all seasons of the year.

There are four unique characteristics of the climate and geography North of 60 which are not found functioning together in the more southerly regions – extended periods of daylight or darkness, a ground condition known as "permafrost", extended temperature range and the topographical region of the "barrens" and Arctic Archipelago.

The Arctic Circle marks the southern limit of the area where the sun does not set for one or more days during the summer and does not rise for one or more days during winter. The time of continual daylight north of the Arctic Circle is known as the period of the "midnight sun".

The word "permafrost" is used to describe that part of the earth's crust that is less than 32 degrees Fahrenheit (0 degrees Centigrade) in temperature.

The extended temperature range simply means the extremes in temperature that occur in the North as the seasons change. Because of extremes in wind and temperature and the low level of precipitation in the far north, tree life becomes non-existent. The irregular line marking the northern limit of tree growth is known as the "tree line". It runs roughly on a diagonal from the mouth of the Mackenzie River on the Beaufort Sea, southeast to Hudson Bay, at approximately 60°N. North of this tree line are the "barrens" – low-lying land with innumerable lakes, swamps and muskeg. Beyond the barrens is the Arctic Archipelago a desolate region of mountains, barren islands and glaciers. (See Map 9E–1)

## 9E–1.1.1 – YUKON TERRITORY

The Yukon is a rugged land of plateaus and mountain ranges, cut off from the Pacific by the Coast and St. Elias Ranges which provide a barrier to the maritime influences from the Pacific. On the east, the Mackenzie Mountains, with ridges of about 8,000 feet, provide a physical barrier separating the Yukon from the Northwest Territories. This barrier also provides a lesser defence from the winter cold waves of the Arctic.

The mountains of the Yukon form the northern part of the Cordilleran Region of North America. Mount Logan in the western Yukon, at 19850 feet, is Canada's highest mountain and the second highest in North America. East of the Mackenzie Mountains lies the Interior Plain, a rough, irregularly rolling upland, with an average elevation of 4,000 feet. Mountain ranges within the interior plateau rise as high as 7,000 feet.

Cutting through both the mountain systems and the plateau are numerous river valleys, some with flat bottoms and sloping sides, while others have deep, narrow gorges with sides rising sharply. The rivers of the Yukon Territory rise in the northern limits of the

Cordilleran mountain region and flow westward to the Pacific as part of the Pacific Drainage Basin. The Pelly, Stewart and Yukon Rivers are the major elements of this drainage system.

**Climate**

In climatological terms, the "Arctic" is defined as the area where the mean daily temperature of the warmest month of the year does not exceed 50 degrees F. In general the line marking the southern limit of this area follows the same pattern as the "tree line". The regions of the Yukon and Northwest Territories below this "tree line" are "sub-arctic".

Except for the extreme northern tip, the Yukon Territory is sub-arctic. Wide variations in temperature from month to month and year to year are characteristic of the Territory. The coldest winter months have averaged from -40 to -50 degrees F, while other winter months have an average temperature above 0 degrees F.

The geographic location of the Yukon is mainly responsible for these marked variations in weather. The Territory extends from the relatively warm Pacific to the cold Arctic Ocean. When cold air masses from the Arctic Ocean stagnate over the Yukon, temperatures drop rapidly and remain very low. Fortunately, periods of intense cold are usually of short duration. If the Arctic cold air masses move on eastward, warm air from the north Pacific Ocean fills in behind and winter temperatures may be relatively mild. January mean temperatures:

+ 5°F at Whitehorse
– 2°F at Testlin
– 7°F at Watson Lake
– 16°F at Dawson.

The settlement of Snag holds the record minimum for North America at -81 degrees F. Other minimum temperature records are -62 degrees F. at Whitehorse, -63 degrees F at Teslin and -74 degrees F at Watson Lake. In winter, the days are generally short with no effective sunshine.

Summer temperatures also vary according to the predominant air mass movements. Days can be quite hot when air from the Pacific Ocean or Alaska lies over the Yukon; when the Arctic air invades the Territory cold temperatures prevail. The summers, though short, are pleasantly warm with mean temperatures above 50 degrees F during the months of June, July and August.

The highest temperature on record in the Yukon is 95 degrees F at Dawson and Mayo.

The frost free season is short, ranging from 21 days at Pine Creek to 85 days at Watson Lake. On an average, the last spring frost occurs in mid-June and the first autumn frost in mid–August.

Although the summer season is short the length of days helps to offset such a limited growing period. Dawson City has almost 24 hours of daylight during late June and 20 hours during July. Farther south Whitehorse has about 20 hours of daylight in June and 18 hours in July.

Mean annual precipitation is remarkably uniform over most of the Yukon Territory ranging from 9 to 17 inches at the valley stations. This relatively low amount is due mainly to the high barrier presented by the St. Elias Mountains which cut off moist air from


GENERAL LOCATION MAP
SCALE OF MILES
ARCTIC OCEAN
QUEEN ELIZABETH ISLANDS
BEAUFORT SEA
BANKS ISLAND
VICTORIA ISLAND
VISCOUNT MELVILLE SOUND
Melville Island
Devon Island
Lancaster Sound
Resolute
Somerset Island
Boothia Peninsula
Cambridge Bay
Coppermine
Great Bear Lake
Great Slave Lake
Yellowknife
Fort Smith
Fort Simpson
Norman Wells
Dawson
Whitehorse
Yukon Territory
NORTHWEST TERRITORIES
Baffin Island
BAFFIN BAY
Frobisher Bay
Southampton Island
Coral Harbour
Baker Lake
Arctic Circle
HUDSON BAY
MAP NO 9e-1

MAP No. 9E–1

the Pacific. There is no pronounced wet or dry season although at most weather stations, July and August are the rainiest months and the spring has the least precipitation.

Winter snowfall averages from 40 inches to more than 80 inches with the heaviest falls in the Laird Valley in the St. Elias Mountains and on the westward slopes of the Mackenzie Mountains. Snow usually lies in the valleys from about mid-October to early April. The snow and ice fields of the St. Elias Mountains provide an important source of water for the rivers in the southwestern part of the Territory.

## 9E–1.1.2 – NORTHWEST TERRITORIES

The Northwest Territories are immense, a land of great contrasts, of mountains and plains, innumerable lakes and semi-deserts, vast expanses of spongy muskeg and stark outcroppings of ancient rock.

The mainland of the Northwest Territories consists of two major geological regions, the Precambrian or Canadian Shield and the Interior Plains. The mountainous Cordilleran region forms the great divide between the Yukon and the Northwest Territories.

The Precambrian Shield, consisting of 700,000 square miles of bedrock, mostly granite, extends from Great Slave Lake in the west to Baffin Island in the east. Except for the rugged mountains of the eastern islands, the Shield rarely rises more than a few hundred feet. Nevertheless, it presents a rugged barren landscape characterized by rolling hills and valleys. In places, the valleys are water-filled which results in striking, finger-like lakes. Then western edge of the Shield is marked by Great Bear and Great Slave Lakes, the largest lakes in Canada.

The Interior Plains lie between the Shield and the Cordilleran region of the western mountains. The plains are a continuation of the Great Plains that stretch from the Gulf of Mexico northward. Within the Territories the plains are dominated by the Mackenzie River.

The variety and contrast of the Arctic Islands is great and often starkly picturesque. In the east, the ancient Precambrian rocks form a spine of mountains from Baffin to Ellesmere Island which rise to heights of 10,000 feet with spectacular vertical cliffs and deep fiords along their eastern coasts. Glaciers are found in the higher altitudes. To the west, are the Arctic lowlands, consisting of recent limestones, sandstones, shale and gravel. North and northwest of these lowlands lies the Sverdrup Basin, an area of higher relief formed by drastic alteration of the sedimentary rocks. At the extreme northwest and fronting the polar basin, is a thin shelf of sedimentary rocks that makes up the Arctic Coastal Plain.

The lands of the Territories, particularly the Arctic, were greatly altered by glaciation. As the glaciers retreated the area was relieved of its tremendous burden of ice and has been rising slowly ever since. The advancing and retreating glaciers sculptured and shaped the face of the area. In regions of the Shield they scraped, smoothed and exposed bare bedrock. In places they formed series of low, elongated parallel hills called moraines. In other areas the granite or sedimentary bedrock was covered with boulders, sand and silt. The streams of water produced from the melting glaciers washed out and deposited sand in the form of long, low hills or eskers that resemble serpentine railway embankments running for miles across the country.

Geologically the arctic regions have just emerged from the last glacial period and in a sense are still in the grip of a "little ice age". The ice fields and glaciers of the eastern Arctic cover 60,000 square miles. In addition the arctic seas and straits are ice filled for a large part of the year.

The major river systems of the Territories are closely related to the physical regions. In the Precambrian Shield area the main rivers are the Thelon, Kazan, Dubawnt and Back. With the exception of the Thelon, these rivers have falls, cataracts and innumerable shallow rapids which impede navigation. In the Interior Plains, the great, central river is the Mackenzie. In contrast to the rivers of the Shield this river is navigable for the whole of its 1400 mile length. It reaches the sea through an extensive maze of channels which wind through a delta spreading over several hundred square miles.

**Climate**

Approximately half the mainland area of the Northwest Territories and all of the Arctic Islands lie in the Arctic.

For more than half of the year these regions experience severe and persistent cold. The freezing season starts in September over the high Arctic, advances southward, following progressively colder air outbreaks and reaches the southern limits of the sub-Arctic in late October. The turbulent flow of cold air, as it spreads across the relatively warmer open seas and channels, produces the stormiest period of the year and accounts for most of the winter's snowfall. By December, with most of the moisture sources sealed off by ice, the cold atmosphere contains so little moisture that the few disturbances produce only thin cloud layers, and consequently, snowfall is very light. Average annual snowfall in the Arctic region is less than 30 inches.

Temperatures seldom rise above the freezing point from December to February in the sub-Arctic, and from November to April in the Arctic. Blowing snow and the chilling effect of strong winds present major hazards to winter travel throughout the treeless Arctic, although the frequency and severity of blizzard conditions vary widely over the region. The region most frequented by blizzards is the barren lands west of Hudson Bay, where strong winds are common. January is normally the coldest month.

In the Mackenzie Basin mean monthly temperatures are below 30 degrees fahrenheit for seven months, April to October, although winter minimum temperatures may fall below -70 degrees F and summer maximum rise above 95 degrees F.

On the barrens mean temperatures are below freezing for eight or nine months of the year.

In the Arctic Islands the mean annual temperatures are lower than in any other part of Canada, -15 degrees F and 0 degrees F in the very far north on Melville and Ellesmere Islands.

In the winter most water surfaces are frozen but the new ice is usually less than six feet thick. The highest mean January temperatures occur in the Hudson Strait area with values ranging from 0 degrees F to -5 degrees F at the eastern entrance and -10 degrees F to -15 degrees F at the western end. The lowest January mean of -30 degrees F to -35 degrees F occurs north of 75° latitude which cuts through the lower part of Melville Island.

February marks the start of a return to warmer weather in the Northwest Territories. However, temperatures above freezing are not reached until May in the sub-Arctic, and June in the Arctic. In the Mackenzie Valley the snows disappear in May, but not until June in the Arctic. Summer is short but pleasantly sunny and warm in the sub-Arctic. In the Mackenzie Valley there are three summer months with temperatures over 50 degrees F. The warmest month in the valley is July with a mean of about 60 degrees F in the upper portion of the region. The frost-free period in the Mackenzie Basin varies from 50 to 100 days.

On the barrens the mean daily maximum temperature during the summer months rises to 55 degrees F or 60 degrees F. Extreme summer temperatures have exceeded 85 degrees F occasionally. Spring comes very late, delayed by the slow melting of the ice and subsequently, by the cold water of the sea, lakes and muskeg. Freezing temperatures may occur during any month of the year, but on the average there is a frost-free period of 40 to more than 60 days throughout the region.

In the Arctic Archipelago temperature extremes are not as severe as in a continental area at the same latitude. During the cool, brief summer the ice-filled polar waters, with a surface temperature near 30 degrees F, prevent the air from warming to any extent. Consequently, summer temperatures are uniformly cool throughout the entire region, averaging 40 degrees F to 45 degrees F during July, the warmest month.

Precipitation in the Territories is light. In the Mackenzie Basin the annual total range is from 9 to 15 inches. Annual snowfall in the sub-Arctic area is about 50 inches. On the barrens precipitation decreases from 12 inches in the south to seven or eight inches in the north, with snowfall contributing about 40 to 50% of the total moisture. Snowfall in the Arctic region is less than 30 inches annually. The greatest amount of precipitation in the barrens falls in the summer and early autumn. Snow covers the ground for almost eight months of the year, with the greatest monthly snowfall in October and November. Strong winds are frequent in this area in winter, especially the District of Keewatin.

The Arctic Archipelago is one of the driest regions in the world. The annual total precipitation over the islands north of the Parry group averages less than 5 inches, with Eureka having an average of only 2.5 inches and Mould Bay only 3 inches a year.

Southward from the Parry Islands there is an increase of annual precipitation. In southern Baffin Island the mean annual totals range from 10 to 15 inches. Snow may fall during any month of the year but rain is limited to the relatively short, summer warm period. In the south 40 to 50% of the annual total precipitation occurs as rain and in the very far north this is decreased to about 30%. Although showers and even a rare thunderstorm may occur occasionally in the southern part of the Archipelago, most annual rainfall is in the form of a light drizzle. Although snowfall is light in the Arctic, a distinct monthly maximum is observed in the autumn and also a spring maximum which is not as marked in the southern half of the Archipelago as in the north. The tiny snow crystals are readily blown about by the wind, and as a result most of the ground is bare all winter, while deep drifts are formed in ravines, hollows and in the lee of obstacles.

## 9E–2.1 – PERMAFROST

Perennially frozen ground or permafrost, is probably the best known and yet least understood feature of the North. Although not a new phenomenon, it is only the relatively recent building of resource development projects that has made the special problems of construction in permafrost so evident to engineers.

"Permafrost" is that part of the earth's crust where the temperature is below 32 degrees F. The term describes only the thermal condition of the ground and not its composition which may be bedrock, gravel, sand, silt, clay or muskeg, singly or in combination.

In the case of solid rock, gravel and sand, the frozen condition does not seriously affect the engineering properties of material. If, however, the ground consists of water-bearing silt or clay, freezing transforms the material to a hard and solid mass. It is to such perennially frozen silt and clay that the name permafrost is popularly applied.

The ground in permafrost areas is normally thought of as two distinct layers: the upper, or active layer, which alternately freezes and thaws with the seasons; and the lower, or permafrost layer, which remains frozen continuously. The depth of the active layer varies with many local factors including soil type, moisture content and vegetative cover in much the same way as depth of frost penetration varies with local conditions in the more southerly areas of Canada. Similarly, foundations located in the active zone are exposed to frost action problems analogous to those encountered in the freezing zone of the soil in more temperate regions. Almost one-half of the land area of Canada is underlain by permafrost. Although chiefly confined to the Northwest Territories and Yukon Territory, it does extend into the upper portions of the provinces, particularly into the northern parts of Manitoba and Quebec. As would be expected, the thickness of permafrost increases toward the north, ranging from a few feet in areas such as Hay River to approximately 1300 feet at Resolute Bay in the Arctic Islands.

The southern limit of permafrost is not a well-defined line, it consists of a belt of land several hundred miles wide in which areas of continuous permafrost give way to areas of sporadic permafrost, where the frozen ground tends to exist only as scattered patches or islands within the unfrozen material.

It is these latter areas that often pose the most difficult construction problems for the engineer, due mainly to the limited extent of permafrost and consequent difficulty of predicting its occurrence at a specific location, and to its temperature which is generally near 32 degrees F and thus close to melting.

It is the melting of permafrost containing large quantities of ice that gives rise to the major construction problems in permafrost areas. The ice in frozen soil can take the form of layers or lenses ranging from hairline size to 3 or 4 feet in thickness, or can occur as coatings over small soil particles, stones and boulders. Some of the most spectacular ice deposits are found as chunks or wedges buried in the frozen ground.

For soils in a frozen condition, the ice acts like a cement, bonding the individual particles together and producing a soil with considerable strength. When thawed, however, the hard-frozen soil can change to a soft slurry with little or no supporting power.

Knowledge of the ice content of frozen soil is of major importance to the engineer since it provides a measure of the extent to which settlements will occur or trafficability will be affected by thawing. Materials such as frozen rock, gravel, or coarse sand frequently contain little ice and thus impose few problems. Much of the Territories, however, is

underlain by fine-grained soils resulting from glacial action. Such soils generally have high ice contents up to six times that of the soil by volume and if these are to provide suitable support for engineering structures, they must not be allowed to thaw. This is difficult to achieve in view of the extreme sensitivity of permafrost to temperature differences.

In undisturbed areas of permafrost, a delicate condition of temperature equilibrium exists between the top of the permafrost and the ground surface. Any changes in the natural insulating cover such as the stripping of moss can upset this thermal balance of nature and start the permafrost thawing. Even one passage of a tracked vehicle over the natural ground surface will reduce the insulating value of the moss cover sufficiently to cause thawing.

Preservation of the frozen condition during construction and operation of a building or other engineering facility requires not only specific design and construction techniques but also strict discipline and control of all construction operations. In many cases, it is necessary to protect the organic cover prior to beginning work in an area by placing a one-to-two foot gravel layer over all areas that might be disturbed.

Another property of permafrost is its imperviousness to the flow of water. Water cannot percolate through the perennially frozen ground, so all water movement tends to occur over or just below the ground surface. This lack of sub-surface drainage often results in an excess of surface water even though much of the Territories is characterized by very low precipitation. If natural drainage is impeded by construction, the accumulated water will accelerate the thawing of the permafrost, with possible serious results.

Since the problems of construction are greatly lessened in rock or granular soils with little ice content, location of such areas is a most important element in northern construction.

Although the siting of engineering facilities on granular materials containing little or no ice permits the use of conventional design and construction techniques, this is not always possible. Where fine-grained materials with high ice contents must be utilized, every effort should be made to preserve the frozen condition of the ground.

The way in which this is achieved in practice will depend on the type of engineering structure. For heated buildings and most enclosures, the ventilation method is commonly used. With this method, the structure is raised above the ground to permit circulation of air beneath, thus minimizing heat flow to the permafrost. The foundations are usually embedded in the perennially frozen ground so that some lowering of the permafrost table can be tolerated without loss of support. Steamed-in piles have proved particularly well suited to this method in fine-graded soils. Where stones and boulders in the soil make pile placing difficult, however, alternative foundation designs may prove more economical.

Occasionally, surface foundations are used. In such cases, an insulating blanket of gravel is first placed on the undisturbed ground to retard downward heat flow from the building constructed over it. This method must be used with caution since the thickness of gravel required to preserve the permafrost will vary with many local factors and is difficult to predict. Within this type of construction, even slight lowering of the permafrost table may cause settlement depending on the soil properties, and in addition, the problem of frost action in the active layer of soil beneath building may prove serious.

These considerations become particularly critical in road and airstrip construction where the ventilation method, as used with buildings, cannot be applied and an

insulating gravel blanket must be relied on to retain the thermal regime. In such cases, the importance of selecting the most favorable site and of keeping disturbance of the surface cover to an absolute minimum in poor soil conditions takes on even greater significance. The only exception to this principle of preserving the frozen ground exists in patches and is close to melting. In these areas it may be economical to remove the permafrost by thawing prior to construction and then to build in the normal way.

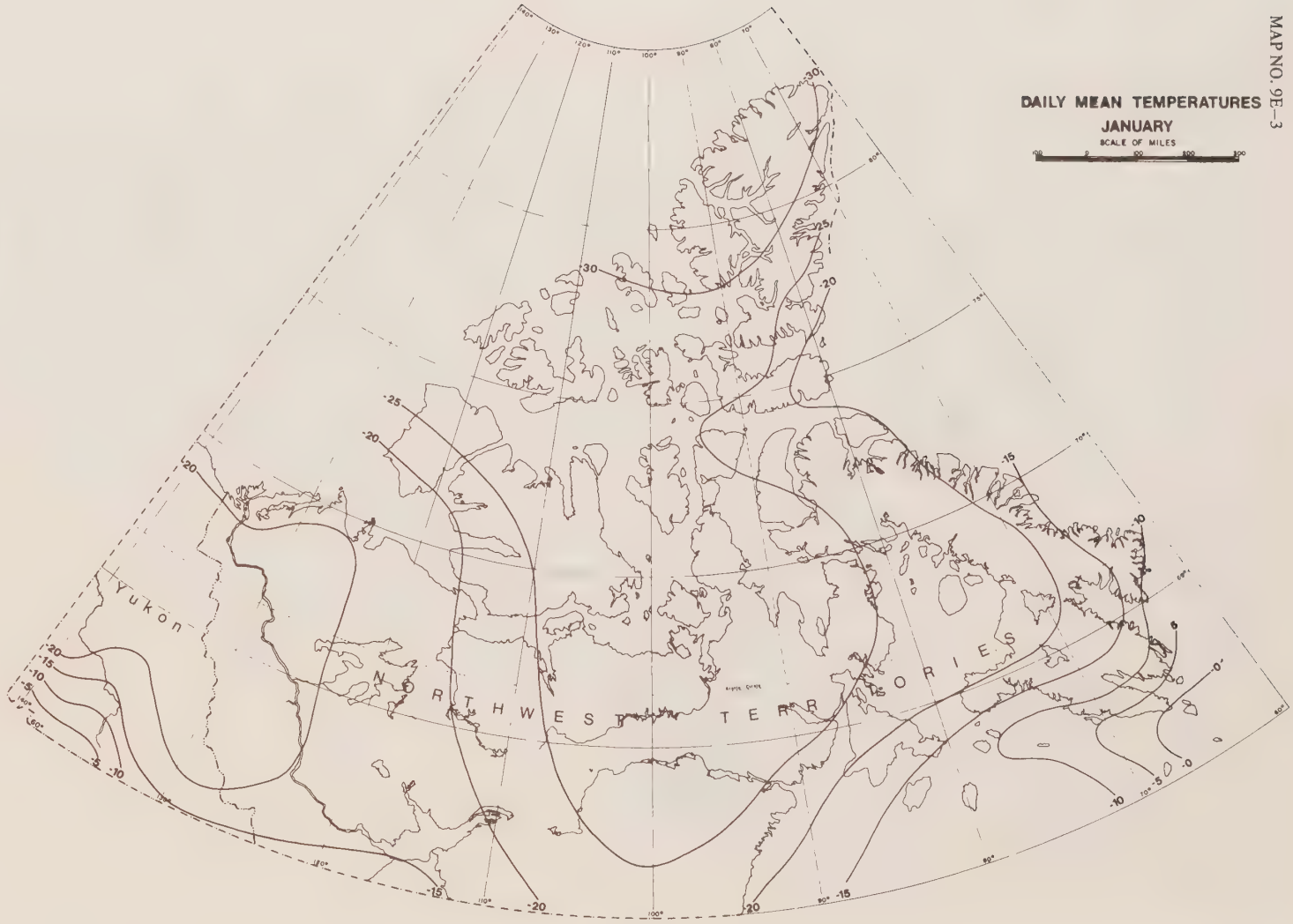
Normal excavation techniques are much less effective in permafrost. Where gravel fill is required, particularly the large amounts needed for roads and airstrips, borrow pits should be located, stripped of vegetation, and allowed to thaw by natural means, well in advance of construction.

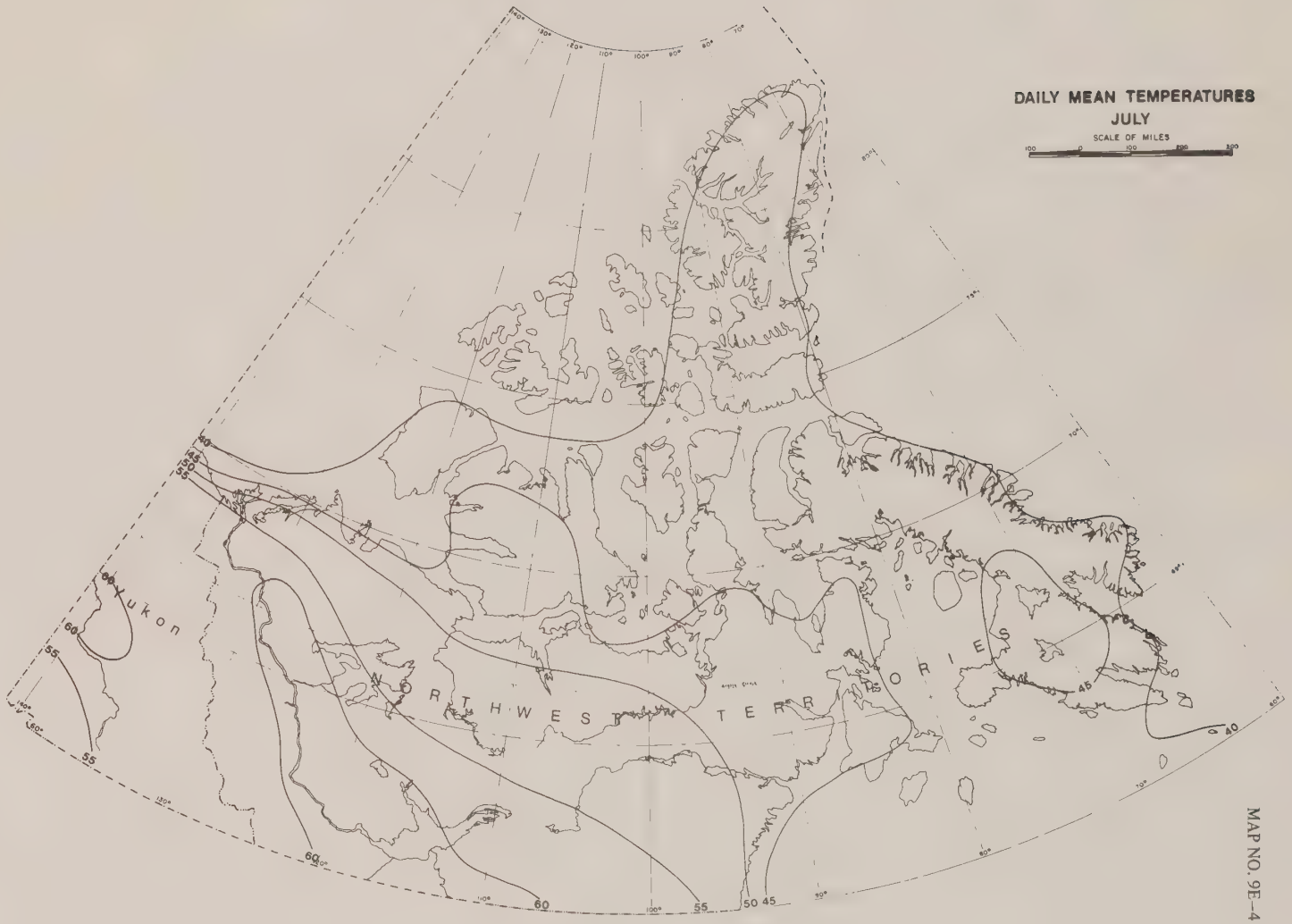
Permafrost imposes difficulties with water and sewage facilities by complicating the location of sub-surface water supplies and seriously limiting the use of the usual methods of sewage disposal into the soil. In addition to the foundation stability problem resulting from thawing of permafrost, water and sewer lines cannot be placed below frost level and are therefore subject to freezing hazards. To overcome such difficulties, the utility lines are often placed in heated and insulated boxes, called utilidors, located above grade and supported in a manner similar to buildings. (See Maps 9E 2 to 9E 4)


CLIMATIC REGIONS
SCALE OF MILES
LEGEND
TUNDRA
SUB ARCTIC
CLIMATIC DIVISION
CONTINUOUS
DISCONTINUOUS
PERMAFROST DIVISION
GLACIER
Tundra
Sub-Arctic
Climatic
Climatic
Region
Region
Continuous
Discontinuous
Permafrost
Permafrost

MAP NO. 9E–2

MAP NO. 9E-3


DAILY MEAN TEMPERATURES
JANUARY
SCALE OF MILES
Yukon
NORTHWEST TERRITORIES
-30
-25
-20
-15
-10
-5
0


DAILY MEAN TEMPERATURES
JULY
SCALE OF MILES
100 0 100 200 300
YUKON
NORTHWEST TERRITORIES
60
55
50
45
40

MAP NO. 9E–4

## INDEX

## COMMUNICATION "F"



Revised April, 1971.

# COMMUNICATIONS

## 9F–1.1 – General

As the Yukon and the Northwest Territories open their resources for development, government and industry are combining to establish a modern, efficient communications network throughout the vast regions. Today, most of the area North of 60 is linked with southern Canada by the network, which combines a number of communications systems.

In the Yukon Territory most communication facilities are operated by Canadian National Telecommunications. Telecommunications are by land line from Whitehorse to the principal communities of the Yukon. In addition there are land links to the Alaskan Panhandle communities of Skagway and Haines where connections tie-in to the troposphere-scatter system operated along the Alaskan coast.

In the Northwest Territories, commercial telecommunications are provided by Canadian National Telecommunications in the western regions, and by Bell Canada in the eastern regions.

In addition to commercial facilities, several government and private radio networks are in operation North of 60, which provide message services for local residents.

The Federal Department of Transport operates a radio and telegraph network for its aeronautical and meteorological services, for air and marine traffic, and for the transmission of meteorological data.

The Department of Indian Affairs and Northern Development operates a radio network in the Mackenzie District for administration purposes and for forest and game protection. Other networks are operated by the Royal Canadian Mounted Police, the Hudson's Bay Company and various religious missions throughout the Territories.

Radio and television broadcasting is developing rapidly in the Territories. The Northern Service of the Canadian Broadcasting Corporation provides a radio service for most areas through medium and short-wave broadcasts. This Northern Service serves 35 communities on medium wave in the Yukon, the Northwest Territories and the northern areas of the provinces. Program material for the short-wave High Arctic service originates at Montreal and is sent by landline to Sackville, N.B. for transmission.

The Northern Service has five program centres in the Territories: Yellowknife, Inuvik, Frobisher Bay, N.W.T.; Whitehorse. Y.T.; and Churchill, Man. With the exception of Frobisher Bay, all are connected to the national network of the CBC.

The remaining stations in the Territories, designated as Low Power Relay Transmitters (LPRT), are normally unattended. These are grouped into two regional networks having program centres at Whitehorse for the Yukon and Yellowknife for the Mackenzie Valley-Great Slave area. These regional networks are in turn connected to the national English radio network. At each LPRT point a community newscaster reports on local news to the regional network centre for broadcast over the regional network. In addition, most LPRT communities also have a sports correspondent who reports to the regional centre.

The community station at Frobisher Bay is served by tape recordings and short-wave transmission pickups from the southern stations.

Short-wave radio transmission to northern Canada is erratic due to problems of transmission across the auroral zone and interference from foreign broadcasting stations.

The Northern Service of the CBC proposes to install new equipment to improve performance and coverage. The total hours of daily transmission will be extended from the present 8 1/2 to 18 hours.

Television is still a relatively new and costly undertaking North of 60. To provide a television service to residents of remote and isolated areas the CBC has developed a frontier package service. This package consists of a helical-track master video tape recording installation, which is installed in a television network connected or originating studio building. The recorded video tapes are regularly flown to the frontier transmitter stations where video playback units provide the audio and video inputs to the television transmitter. Taped programs run for about four hours.

The CBC frontier package stations are in daily operation in Clinton Creek, Dawson, Elsa, Watson Lake and Whitehorse, Y.T.; and Inuvik, Pine Point and Yellowknife, N.W.T.

A privately owned closed circuit television system operates at Whitehorse.

Creation of a domestic satellite communications system for Canada will have a profound effect on northern Canada. The satellite to be launched in 1972 will enable television and high quality communications to be extended throughout the North. The rate of growth of television service will be dependent on the availability of funds to establish additional earth stations. There is no technical limitation in extending TV coverage to any northern location provided the satellite is visible from the earth station site.

The provision of adequate telephone communication services employing the satellite will evolve over a longer period while technical problems are overcome.

## 9F–2.1 – YUKON TERRITORY

### 9F–2.1.1 – Micro-Relay/Troposphere-Scatter System

The Canadian National Telecommunications/Canadian Pacific Telecommunications network connects the Yukon Territory with southern Canada via Edmonton, Alberta.

A micro-relay system operated by CNT between Grande Prairie, Alberta and Fairbanks, Alaska via Mount Davie in the Yukon, originally built for military purposes, is also used for all non-military traffic to the Yukon and Alaska. The system is designed to provide television transmission facilities with the installation of a TV channel.

A high-quality micro-relay and troposphere-scatter system from Victoria, B.C. to Haines, Alaska, provides an alternate route to the Grande Prairie-Fairbanks system.

### 9F–2.1.2 – Land Lines

Canadian National Telecommunications offers telephone and telegraph land line service to Whitehorse, Mayo, Dawson, Elsa and Keno, and other smaller communities.

### 9F–2.1.3 – Television

The Canadian Broadcasting Corporation provides a four-hour-a-day frontier package service at Clinton Creek, Dawson, Elsa, Watson Lake and Whitehorse. A privately owned, closed circuit television station operates in Whitehorse.

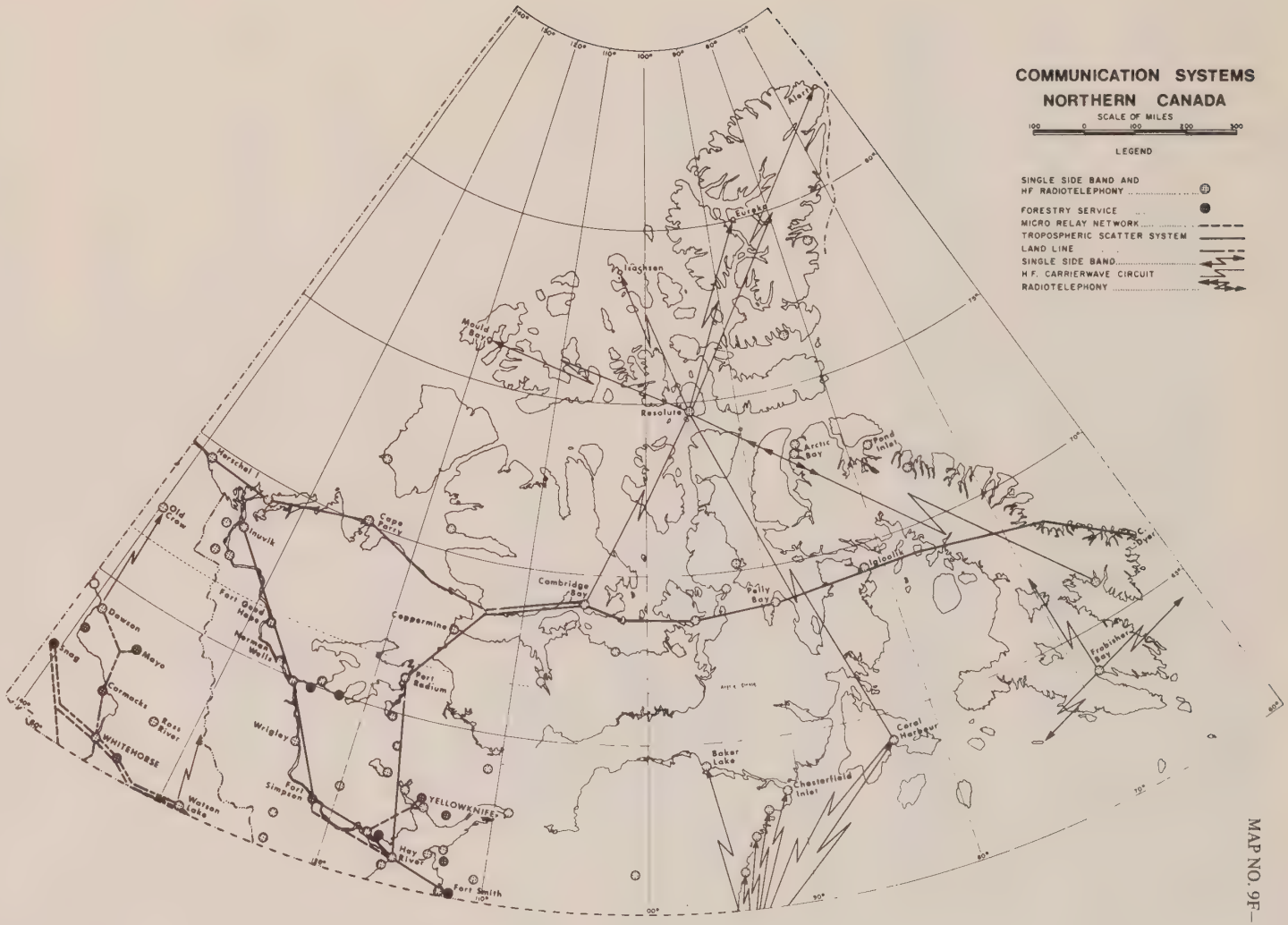
### 9F–2.1.4 – Radio

Short-wave programs are broadcast to the Territories daily from the Canadian Broadcasting Corporation's station at Sackville, N.B. Broadcasts are conducted in English, French and Eskimo.

There are 28 standard wave broadcast stations serving the Yukon and the Northwest Territories. The majority are low-power, unattended, relay transmitters which broadcast the CBC network programs. All are owned and operated by the CBC.

### 9F–2.1.5 – Mail

Regular mail services are available in the Yukon. The frequency of service depends on the size, importance and location of the settlement. Most mail is delivered by air, although in southern areas, both air and truck services are used.


COMMUNICATION SYSTEMS
NORTHERN CANADA
SCALE OF MILES
100 0 100 200 300
LEGEND
SINGLE SIDE BAND AND HF RADIOTELEPHONY
FORESTRY SERVICE
MICRO RELAY NETWORK
TROPOSPHERIC SCATTER SYSTEM
LAND LINE
SINGLE SIDE BAND
H.F. CARRIERWAVE CIRCUIT
RADIOTELEPHONY
Alert
Eureka
Isachsen
Mould Bay
Resolute
Arctic Bay
Pond Inlet
Herschel I
Old Crow
Inuvik
Cape Parry
Cambridge Bay
Pelly Bay
Iglooik
Coppermine
Fort Good Hope
Norman Wells
Dawson
Mayo
Snag
Carmacks
Ross River
WHITEHORSE
Watson Lake
Wrigley
Fort Simpson
Fort Radium
YELLOWKNIFE
Hay River
Fort Smith
Baker Lake
Chesterfield Inlet
Coral Harbour
Frobisher Bay
Lake Harbour

MAP NO. 9F—1

## 9F–3.1 – NORTHWEST TERRITORIES

### 9F–3.1.1 – Micro-Relay/Troposphere – Scatter Systems

Canadian National Telecommunications/Canadian Pacific Telecommunications network serves the Northwest Territories, via Edmonton, Alta.

CNT/Alberta Government Telephones operate a high-quality micro-relay between Edmonton, Alta. and Hay River, N.W.T., to provide a direct link between the Territories and southern Canada.

A combination micro-relay and troposphere-scatter system between Sept Isles, Que. Goose Bay, Labrador and Frobisher Bay handles all traffic to and from Baffin Island and the eastern regions of the Northwest Territories.

CNT/Saskatchewan Government Telephones operate a tropospheric-scatter system between Uranium City, Sask., and Fort Smith, N.W.T. Messages are routed via Hay River, N.W.T.

CNT operates a troposphere-scatter system between Hay River, N.W.T., and Lady Franklin Point, N.W.T. This system was originally built by the USAF for communication with distant early warning stations in the Far North. Telephone and telegraph messages originating in southern Canada are carried on a commercial basis to Lady Franklin Point, and then on leased DEWline facilities to Cambridge Bay, N.W.T.

CNT operates a troposphere-scatter system between Goose Bay, Labrador and Frobisher Bay, NWT, providing services required by Frobisher Bay residents. This is the only direct link between Baffin Island and southern Canada.

### 9F–3.1.2 – Land Lines

A CNT line provides voice and radio transmissions between Hay River, N.W.T. and Inuvik, N.W.T., with connections to intermediate points along the Mackenzie River.

Connected to this system are service extensions to settlements along the Peel River, Tuk, Aklavik and to Reindeer Depot.

A high-quality land line, built and operated by CNT, runs between Fort Smith, N.W.T. and Yellowknife, N.W.T. Settlements along the north and south shores of Great Slave Lake, and Uranium City Sask., are connected to the system.

All communications to the Keewatin district are channelled along the CNT line from The Pas, Man., to Churchill, Man.

### 9F–3.1.3 – Telephone

Bell Canada operates a radio-telephone system between Moosonee, Ont.; Alma, Que.; Goose Bay; Labrador; and Frobisher Bay, N.W.T.; and the smaller communities in the area. Communications from Resolute Bay on Cornwallis Island are transmitted to Frobisher Bay, and then to southern Canada via Goose Bay, Labrador.

### 9F–3.1.4 – Television

The Canadian Broadcasting Corporation provides a frontier package service at Yellowknife, Pine Point and Inuvik.

**9F–3.1.5 – Radio**

Short-wave programs are broadcast by the CBC from its station at Sackville, N.B. in English, French and Eskimo. The service is the only source of Canadian radio programs for residents of the eastern Arctic.

Twenty-eight standard-wave broadcast stations serve both Territories, the majority being low-power, unattended relay transmitters owned and operated by the CBC.

**9F–3.1.6 – Mail**

Regular mail services are available at most settlements in the Northwest Territories. The frequency of service depends on the size, importance and location of the settlement. Most mail is delivered by air.

## 9F–4.1 ADDITIONAL INFORMATION SOURCES

More detailed information on communications services North of 60 may be obtained by writing:

Northern Economic Development Branch,
Department of Indian Affairs and Northern Development,
400 Laurier Avenue,
Ottawa, Ontario.

Canadian National Telecommunications,
600 Peel Street,
Montreal, P.Q.

Canadian National Telecommunications,
CN Tower,
104th Ave. and 100th St.,
Edmonton, Alberta.

Hudson's Bay Company,
Winnipeg,
Manitoba.

Anglican Church of Canada,
600 Jarvis Street,
Toronto, Ontario.

Bell Canada
1050 Beaver Hall Hill,
Montreal, P.Q.

Bell Canada,
1150 Chemin St. Louis,
Sillery, P.Q.

Northern Service,
Canadian Broadcasting Corporation,
Montreal, P.Q.

TABLE 9F-1

TYPICAL TELEPHONE RATES
NORTH OF 60 (IN DOLLARS)

| Route | Day | | Night | |
|---|---|---|---|---|
| | First 3 minutes | Each additional 3 minutes | First 3 minutes | Each additional 3 minutes |
| Edmonton-Yellowknife | 3.75 p-p* | 0.80 | 2.80 | 0.60 |
| | 2.50 s-s** | 0.80 | 1.85 | 0.60 |
| Edmonton-Inuvik | 4.65 | 1.00 | 3.50 | 0.75 |
| | 3.10 | 1.00 | 2.30 | 0.75 |
| Edmonton-Whitehorse | 6.05 | 1.50 | 4.60 | 1.00 |
| | 4.05 | 1.00 | 2.95 | 0.90 |
| Edmonton-Dawson | 6.40 | 1.65 | 4.85 | 1.00 |
| | 4.25 | 1.00 | 3.15 | 0.90 |
| Yellowknife-Whitehorse | 6.20 | 1.35 | 4.65 | 1.00 |
| | 4.15 | 1.35 | 3.10 | 1.00 |

*p-p Person to Person
**s-s Station to Station

TABLE 9F-2

TYPICAL TELEGRAPH RATES
NORTH OF 60 (IN DOLLARS)

| Route | Day Rate | | | Night Rate | |
|---|---|---|---|---|---|
| | First 15 words | Next 10 words (per word) | Each word above 25 | First 50 words | Each group of 10 words over 50 |
| Edmonton-Yellowknife | 1.55 | 0.07 | 0.04 | 1.25 | 0.25 |
| " -Inuvik | 2.15 | 0.09 | 0.06 | 1.75 | 0.35 |
| " -Whitehorse | 1.85 | 0.08 | 0.05 | 1.50 | 0.30 |
| " -Dawson | 2.15 | 0.09 | 0.06 | 1.75 | 0.35 |
| Yellowknife-Whitehorse | 1.55 | 0.07 | 0.04 | 1.25 | 0.25 |

TABLE 9F-3

NAME OF TELECOMMUNICATION AGENCIES

| | DOT | CNT | BELL | RCMP | HBCO | DIA | DNH | DNR |
|---|---|---|---|---|---|---|---|---|
| Aishihik | – | X | | | | | | |
| Aklavik | – | X | | E | | | | |
| Alert | X | | | | | | | |
| Alexandria Fiord | – | | | | | | (B) Opr. Dept. Energy, Mines & Resources | |
| Arctic Bay | – | | X | | B | | | |
| Arctic Red River | | X | | E | B | | | |
| Baker Lake | | | | | | (X) DIA will operate for Bell | | |
| Bathurst Inlet | – | X | | | B | | B | |
| Baychimo | – | | | | B | | | |
| Belcher Island | – | | | | B | | | |
| Broughton Islands | | | P | | B | | | |
| Buffalo River | | X | | | | | | |
| Brie du Poste | | | X | | | | | |
| Batteau | | | X | | | | | |
| Battle Harbour | | | X | | | | | |
| Black Tickle | | | X | | | | | |
| Cape Christan (See Clyde River) | | | | | | | | |
| Cape Dorset | – | | X | | | | | |
| Cape Dyer (DYE) | – | DL | X | | | | | |
| | | Private Toll Stn. operated by USAF through their base station at Goose Bay. | | | | | | |
| Cape Hopes Advance | X | | | | | | | |
| Cape Parry (PIN) | | DL | | | B | | | |
| Cambridge Bay (CAM) | X | X | | | | | | |
| Carmacks | – | X | | E | | | | |

TABLE 9F-3 continued

| | DOT | CNT | BELL | RCMP | HBCO | DIA | DNH | DNR |
|---|---|---|---|---|---|---|---|---|
| Chesterfield Inlet | | | | | | (X) DIA will operate for Bell | | |
| Clyde River | X | | P | | | | | |
| Contwoyto Lake (Pellett Lake) | – | X | | | | | (b) Opr. Pacific West Airways | |
| Coppermine | X | X | | E | | | | |
| Coral Harbour (airport) (See also Southampton Isl.) | X | This Exchange has Extended Area Service with Southampton Island (No Toll Charge) | P | | | | | |
| Cape St. Charles | | | X | | | | | |
| Charlottetown | | | X | | | | | |
| Canatiche | | | X | | | | | |
| Cartwright, Labrador | | | X | | | | | |
| Dawson, Y.T. | – | X | | E | | | | |
| Discovery | – | X | | | | | | |
| Elsa | – | X | | E | | | | |
| Emeril | – | | X | | | | | |
| Ennadai Lake | X | | | | B | | | |
| Enterprise | – | X | | | | | | |
| Eskimo Point | | | | | | (X) DIA will operate for Bell | | |
| Eureka | X | | | | | | | |
| Ferguson Lake | – | | | | | B | | |
| Fifth Meridian | | | | | B | | | |
| Fort Franklin | – | P | | | B | | | |
| Fort Good Hope | – | X | | E | | | | |
| Fort Liard | – | X | | | B | | | |
| Fort McPherson | – | X | | E | | | | |
| Fort Norman | – | X | | E | | | | |
| Fort Providence | – | X | | | | | | |

TABLE 9F-3 continued

| | DOT | CNT | BELL | RCMP | HBCO | DIA | DNH | DNR |
|---|---|---|---|---|---|---|---|---|
| Fort Rae (See Rae) | | | | | | | | |
| Fort Reliance | X | | | | | | | |
| Fort Resolution | X | X | | | | | | |
| Fort Simpson | – | X | | E | | | | |
| | IP | IP | | | | | | |
| Fort Smith | X | X | | | | | | |
| Fort Wrigley (See Wrigley) | | | | | | | | |
| Franklin (See Fort Franklin) | | | | | | | | |
| Frobisher | X | X | IP | | | | | |
| Fort George | | | | | | | | X |
| Fort Chimo | | | | | | | | X |
| Frenchman's Island | | | B | | | | | |
| Fox Harbour | | | B | | | | | |
| Gjoa Haven | – | X | | | | | | |
| Grise Fiord | – | | P | E | | | | |
| George's Cove | | | X | | | | | |
| Goose Bay | | | X | | | | | |
| Great Whale River | | | | | | | | X |
| Hall Lake (FOX) | – | DL | | | | | | |
| Haines Jct. | – | X | | E | | | | |
| Hay River | | IP | | E | | | | |
| | | X | | | | | | |
| Henley Harbour | | | X | | | | | |
| Herschel Island | – | | | E | | | | |
| Holman Island | – | X | | | B | | | |
| Igloolik | – | | X | | B | | | |
| Inuvik | IP | X | | E | | | | |
| | X | | | | | | | |
| Isachsen | X | | | | | | | |
| Ivugivik | | | | | | | | X |
| Jean Marie River | – | X | | | | | | |
| King William Land | | | | | B | | | |
| Knob Lake | | | X | | | | | |
| Koartak | | | | | | | | X |
| Lac La Martre | – | P | | | | | | |

TABLE 9F-3 continued

| | DOT | CNT | BELL | RCMP | HBCO | DIA | DNH | DNR |
|---|---|---|---|---|---|---|---|---|
| Lady Franklin Point | – | X | | | | | | |
| Lake Harbour | – | | P | | B | | | |
| L'Anse au Loup | | | X | | | | | |
| Leaf Bay | | | | | | | | X |
| Lodge Bay | | | X | | | | | |
| MacKay Lake (Tourcanis Mine) | – | X | | | | | | |
| Mayo | – | X | | E | | | | |
| Mould Bay | X | | | | | | | |
| Main | | | X | | | | | |
| Makkovik | | | X | | | | | |
| Manouane | | | X | | | | | |
| Mary's Harbour | | | X | | | | | |
| Nahanni | – | X | | | | | | |
| Nottingham Island | X | | | | | | | |
| Obedjiwan | | X | | | | | | |
| Old Crow (Yukon) | X | | | E | | | | |
| Padley | – | | | | Closed | | | |
| Padloping | – | | P | | | B | | |
| Pangnirtung | – | | X | | B | | | |
| Pallette Lake | | X | | | | | | |
| Pelly Bay | – | P | | | | | | |
| Perry River (Island) | – | X | | | B | | | |
| Pine Point | – | X | | | | | | |
| Pond Inlet | – | | X | | B | | | |
| Port Brabant | – | | | | B | | | |
| Port Burwell | | | X | | | | | |
| Port Radium | – | X | | | | | | |
| Paint Hills | | | | | | | | X |
| Packs Harbour | | | X | | | | | |
| Paradise River | | | X | | | | | |
| Payne Bay | | | | | | | | X |
| Pitts Harbour | | | X | | | | | |

Table 9F-3 continued

| | DOT | CNT | BELL | RCMP | HBCO | DIA | DNH | DNR |
|---|---|---|---|---|---|---|---|---|
| Port Nouveau, Quebec | | | | | | | | X |
| Povungnituk | | | | | | | | X |
| Port Hope Simpson | | | X | | | | | |
| Post ville | | | X | | | | | |
| Port Harrison | | | | | | | | X |
| Rae | – | X | | | | | | |
| Read Island | | | | | | | | |
| Rankin Inlet | | | | | | (X) DIA will operate for Bell | | |
| Reindeer Depot (Station) | – | X | | | | | | |
| Repulse Bay | – | | P | | B | | | |
| Resolute Bay | B | | X | | | | | |
| Resolution Island | X | | | | | | | |
| Rocher River | – | X | | | | | | |
| Ross River | – | X | | | B | | | |
| Red Bay | | | X | | | | | |
| Rigolet | | | X | | | | | |
| Rupert's House | | | X | | | | | |
| Sachs Harbour | X | X | | E | | | | |
| Snag | – | X | | | | | | |
| Snare River | – | X | | | | | | |
| Snowdrift | – | X | | | B | | | |
| Southampton Island (12 miles from Carol Harbour Airport) | X | This Exchange has extended Area Service with Carol Harbour (No Toll Charge). | | | | DIA will operate for Bell | | |
| Spence Bay | – | P | | | B | | | |
| Smokey | | | X | | | | | |
| Sona Lake | | | X | | | | | |
| Spotted Island | | | X | | | | | |
| Sugluk | | | | | | | | X |
| Square Island | | | X | | | | | |

Table 9F-3 continued

| | DOT | CNT | BELL | RCMP | HBCO | DIA | DNH | DNR |
|---|---|---|---|---|---|---|---|---|
| Taltson River | – | X | | | | | | |
| Tavani | – | | | | | Closed | | |
| Teslin | – | X | | E | | | | |
| Thom Bay | – | P | | | | | | |
| Tuktoyaktuk | – | P | | E | | | | |
| Wakeham Bay | | | | | | | | X |
| Watson Lake | – | X | | E | | | | |
| Whale Cove | – | | | | | (X) (Also Oblate Mission) DIA will operate for Bell. | | |
| Whitehorse | – | X | | E | | | | |
| Wonowon | – | X | | | | | | |
| Wrigley (Village) | – | X | | | B | | | |
| Wrigley Airport | – | X | | | | | | |
| Yellowknife | X | X | | E | | | | |

N.B. In various settlements, local operation of telephone communications is carried out by an interdepartmental system for federal use. The public can use this system for only 2 hours at a time.

## TABLE 9F-3
## COMMERCIAL TELEPHONE SERVICE NORTH OF 60

Legend

| | |
|---|---|
| X | – in place – designated carrier |
| P | – Proposed agency |
| DL | – Via DEWline |
| IP | – Interchange Point |
| E | – Emergency Traffic only |
| B | – Private Stn. – May handle messages for others |
| DOT | – Department of Transport |
| CNT | – Canadian National Telecommunications |
| BELL | – Bell Canada |
| RCMP | – Royal Canadian Mounted Police |
| HBCO | – Hudson Bay Company |
| DIA | – Department of Indian Affairs and Northern Development |
| DNR | – Quebec – Department of Natural Resources |
| DNH | – Department of National Health and Welfare |

## INDEX

## NORTH OF 60 BIBLIOGRAPHY "G"

# NORTH OF 60 BIBLIOGRAPHY

The following bibliography is a representative list of recent publications related to the resource and economic development of the Yukon and Northwest Territories. Unless otherwise indicated, enquiries may be directed to:

Librarian,
Department of Indian Affairs and
Northern Development,
400 Laurier Ave.,
Ottawa 4, Ontario.

## 9G–1.1 General


ARCTIC — Published by the Arctic Institute of North America, 3458 Redpath St., Montreal 25, P.Q. This journal contains technical and scientific articles, short summaries of field work, and notes on research in the Arctic and Antarctic. Published four times a year.

ARCTIC BIBLIOGRAPHY — This work now runs into 13 volumes and contains references to 69,455 publications on the Arctic. Each publication is listed under the author's name, and a short summary of what it deals with is given. At the end of each volume, an index lists the subjects of the publications. This bibliography covers works in all languages. Published annually.

ARCTIC CIRCULAR — Published by the Arctic Circle, Ottawa. Includes information on northern research projects and developments. Published quarterly.

BEAVER — Published by the Hudson's Bay Company, Hudson's Bay House, Winnipeg 1, Man. This magazine features popular and historical articles on the Canadian West and the North. Published four times a year.

CANADIAN GEOGRAPHIC JOURNAL — This magazine, published by the Royal Canadian Geographical Society, 54 Park Avenue, Ottawa 4, frequently features articles on the Canadian Arctic. Published monthly.

NORTH — Published by the Queen's Printer for the Northern Administration Branch, Department of Indian Affairs and Northern Development. This magazine contains popular articles on the North. Published every two months.

POLAR RECORD — Published by the Scott Polar Research Institute, Cambridge, England. This publication contains technical and scientific articles and papers, short summaries of the work of polar expeditions and a bibliography. Published three times a year.

## 9G–2.1 SOCIO-ECONOMIC STUDIES – Northwest Territories

Following are selected socio-economic studies pertaining to the Northwest Territories conducted by the Department of Indian Affairs and Northern Development.

### 2.1.1 Northern Science Research Group

| | |
|---|---|
| Aasen, C., | Comprehensive Settlement Planning in the Mackenzie Delta, NWT. |
| Bourne, L.S. | Yellowknife, NWT – A Study of Its Urban and Religious Community, 1963 |
| Cohen, T. | An Anthropological Survey of Communities in the Mackenzie – Slave Lake Region of Canada, 1962 |
| Cooper, P.F., Jr. | Air-Cushion Vehicles in the Canadian North, 1965 |
| Cooper, P.F., Jr. | The Mackenzie Delta – Technology, 1966 |
| Dailey, R.C. and Dailey, L.A. | The Eskimo of Rankin Inlet: A Preliminary Report, 1961 |
| Dunbar, M.J. | Preliminary Report on the Bering Strait Scheme, 1960 |
| Dunbar, M.J. | Second Report on the Bering Strait Dam, 1962 |
| Ervin, A.M. | New Northern Townsmen in Inuvik, 1968 |
| Ferguson, J.D. | The Human Ecology and Social Economic Change in the Community of Tuktoyaktuk, NWT, 1961 |
| Helm, J. and Lurie, N.O. | The Subsistence Economy of the Dogrib Indians of Lac La Martre in the Mackenzie District of the NWT, 1961 |
| Hill, R.M. | Mackenzie Reindeer Operations, 1967 |
| Honigmann, J.J. | Foodways in a Muskeg Community, 1962 |
| Jenness, R.A. | Great Slave Lake Fishing, 1963 |
| Lotz, J.R. | Government Research and Surveys in the Canadian North, 1956-61 Ed. |
| Mailhot, J. | Inuvik Community Structure – Summer 1965 |
| Parker, V.J. | The Planned Non-Permanent Community, 1963 |
| Parsons, G. | Attitudes of Inuvik Transient Residents, 1969 |
| Smith, G.H. | Territorial Sovereignty in the Canadian North, 1963 |
| Smith, D.G. | The Mackenzie Delta – Domestic Economy of the Native People, 1967 |

| | |
|---|---|
| Stevenson, D.S. | Problems of Eskimo Relocation for Industrial Employment, 1969 |
| Sue, H. | Mackenzie Delta Bibliography, 1969 |
| Usher, P.J. | Economic Basis and Resource Use of the Coppermine – Holman Region, NWT, 1965 |
| Van Stone, J.W. | The Economy and Population Shifts of the Eskimos of Southampton Island, 1959 |
| Van Stone, J.W. | The Economy of a Frontier Community, 1961 |
| Wolforth, J.R. | The Mackenzie Delta – Its Economic Base and Development, 1966 |
| Wolforth, J.R. | The Mackenzie Delta – Changes in Human Ecology, 1969 |

An abstract entitled "Social Science Research Abstracts, 1959-1965", prepared by the Northern Science Research Group of the Department of Indian Affairs and Northern Development in 1966 covers most of the subjects listed above.

Enquiries for the above publications should be referred to:

Chief, Northern Science Research Group,
Department of Indian Affairs and Northern Development,
400 Laurier Ave. W.,
Ottawa 4, Ontario.

**9G–2.1.2 Advisory Committee on Northern Development**

Government Activities in the North, 1961 – 1967 inclusive.

These reports are available from:

Information Services Division,
Department of Indian Affairs and Northern Development,
400 Laurier Ave. W.,
Ottawa 4, Ontario.

**9G–2.1.3 Industrial Division Area Economic Surveys**

| | |
|---|---|
| Abrahamson, G. | Tuktoyaktuk – Cape Parry, 1962 |
| Anders, G. | Northern Foxe Basin, 1965 |
| Anders, G. | Rae – Lac La Martre, 1966 |
| Anders, G. | East Coast – Baffin Island, 1966 |
| Bissett, D. | Lancaster Sound, 1967 |
| Brack, D. | Southampton Island, 1962 |

9G–2.1.3

| | |
|---|---|
| Brack, D., and McIntosh, D. | Keewatin Mainland, 1963 |
| Currie, R. | Western Ungava, 1962 |
| Evans, J. | Ungava Bay, 1958 |
| Higgins, G. | South Coast – Baffin Island, 1967 |
| MacBain, S. | Frobisher Bay, 1966 |
| Radojicic, D. | South Shore – Great Slave Lake, 1967 |
| Usher, P.J. | Banks Island, 1965 |
| Villiers, D. | Central Mackenzie, 1967 |

Enquiries for the above publications should be reffered to:

Industrial Division,
Department of Indian Affairs and Northern Development,
400 Laurier Ave. W.,
Ottawa 4, Ontario.

**9G–2.1.4 Northern Economic Development Branch**

| | |
|---|---|
| Armstrong, G.T. and Freyman, A.J. | Cost and Benefit Analysis on a Lead-Zinc Smelter at Pine Point, NWT, 1969 |
| Canadian Bechtel Limited, Montreal | Lead-Zinc Smelter Study, Pine Point, NWT – Feasibility Study prepared for the Government of Canada by Canadian Bechtel Limited, 1969 |
| Economic Staff Group | Report on Northwest Territories Manpower Test Survey, 1967 |

## 9G–3.1 Economic Studies – Yukon Territory

Following are selected economic studies pertaining to the Yukon Territory conducted or commissioned by the Department of Indian Affairs and Northern Development:

| | |
|---|---|
| Barry, G.S. | Mineral Resource Analysis in the Yukon and the District of Mackenzie, NWT., in relation to the 10-year and 20-year Northern Roads Construction Program, 1967. |
| Carr, D.W. and Associates Ltd. | Yukon Economic Study, 1968 |
| Ingledow, T. & Associates Limited | Hydro-Electric Resources Survey of the Central Yukon Territory, Volumes 1 and 2, January, 1968 |
| Interdepartmental Committee | The Need for Canadian Access Through the Alaska Panhandle, a report of the task force for consideration of the Interdepartmental Committee on Pacific Coast Transportation, 1968 |
| Public Works, Department of | Engineering Study, Alaska Highway, Canadian Section, 1966 |
| Stanford Research Institute | Improvement Program for Alaska Highway, an analysis of economic benefit, 1966 |
| Touche, Ross, Bailey & Smart | Yukon Territory Taxation Study, 1968 |
| Travacon Research Limited | Yukon Transportation Study, 1968 |

## 9G–4.1 – MINES AND MINERALS


| | |
|---|---|
| Christie, K.N. | Known Mineralized Areas and Mining Development, Yukon Territory and Northwest Territories, 1960. |
| Department of Indian Affairs and Northern Development | Annual Report, 1968. |
| Department of Indian Affairs and Northern Development. | Guide to Northern Non-Renewable Resources, Yukon, Northwest Territories and Arctic Islands, 1964. |
| Department of Indian Affairs and Northern Development | Investment Possibilities in Northern Canada, a speech by Hon. Arthur Laing, Minister of Indian Affairs and Northern Development, 1967, to New York Society of Security Analysts. |
| Department of Indian Affairs and Northern Development | Mining and Minerals North of 60, 1968. |
| Department of Indian Affairs and Northern Development | Mining Statistics, Northwest Territories and Yukon Territory. Published monthly. |
| Lancaster, M.J. | Mineral Resources and Industries of the Northwestern Canadian Shield, 1962. |
| Northwest Territories | Annual Report of the Commissioner, 1968. |
| Oliver, A.D. | Far Northern Mineral Exploration for 1967-68, a paper presented at Prospector's and Developer's Convention, Toronto, 1968. |
| Yukon Territory | Annual Report of the Commissioner, 1968. |

## 9G–5.1 – OIL AND GAS


| | |
|---|---|
| Department of Indian Affairs and Northern Development | Annual Report, 1968 |
| Department of Indian Affairs and Northern Development | Oil and Gas North of 60, 1968. |
| Geological Survey of Canada | Geology and Petroleum Potentialities of Northern Canada 1963 (see included bibliography) |
| Northwest Territories | Annual Report of the Commissioner, 1968. |
| Quirin, G. David | Economics of Oil and Gas Development in Northern Canada 1962 (see included bibliography). |
| Yukon Territory | Annual Report of the Commissioner, 1968. |

## 9G–6.1 – WATER

| | |
|---|---|
| Department of Indian Affairs and Northern Development | Annual Report, 1968. |
| Department of Indian Affairs and Northern Development | Hydro-Electric Resources Survey of the Central Yukon Territory, 1968. |
| Northwest Territories | Annual Report of the Commissioner, 1968. |
| Yukon Territory | Annual Report of the Commissioner, 1968. |

## 9G–7.1 – FORESTRY


| | |
|---|---|
| Department of Indian Affairs and Northern Development | Annual Report, 1968. |
| Flanagan, R.T. | The Forests of Northern Canada, **North**, Sept.-Oct., 1963. |
| Northwest Territories | Annual Report of the Commissioner, 1968. |
| Yukon Territory | Annual Report of the Commissioner, 1968. |

## 9G–8.1 – LAND

| | |
|---|---|
| Department of Indian Affairs and Northern Development | Annual Report, 1968. |
| Northwest Territories | Annual Report of the Commissioner, 1968. |
| Yukon Territory | Annual Report of the Commissioner, 1968. |

## 9G–9.1 – TRANSPORT


| | |
|---|---|
| Canada Hydrographic Service | **Pilot of Arctic Canada.** 2nd ed. 1968. |
| Department of Indian Affairs and Northern Development | Northern Roads Fact Finding Committee Report, 1967 |
| Department of Indian Affairs and Northern Development | Annual Report, 1968. |
| Molloy, Arthur E. | Arctic Science and the Nuclear Submarine, **Arctic**, June, 1962. |
| Nicholson, Cdr. J.H. | The Nuclear Submarine and the Arctic. **North**, Nov.-Dec. 1962. |
| Northwest Territories | Annual Report of the Commissioner, 1968. |
| Northern Transportation Company | Annual Report, 1968. |
| Stanford Research Institute | Improvement program for Alaska Highway, and analysis of economic benefit, 1966. |
| Travacon Research Ltd. | Yukon Transportation Study, 1968. |
| Weick, E.R. | Road Transport in the Pioneer North. A paper presented at the Canadian Transportation Research Forum, Quebec City, 1965. |
| Woods, K.B. and Legget, R.F. | Transportation and Economic Potential in the Arctic, National Research Council technical report, 1960. |

## 9G–10.1 – PEOPLE


Bladen, V.W. — **Canadian Population and Northern Colonization,** Toronto, Royal Society of Canada, 1962.

Birket-Smith, KAJ. — **The Eskimos,** 2nd edition, London, 1959.

Department of Indian Affairs and Northern Development — **People of Light and Dark**, Queen's Printer, 1966.

Ferguson, J.D. — The Human Ecology and Social Economic Change in the Community of Tuktoyaktuk, NWT. Northern Co–ordination and Research Centre. Report NCRC – 61-2. Department of Indian Affairs and Northern Development. 1961.

Frison-Roche, Roger — **Peuples chasseur de l'arctique.** Paris, Arthaud, 1966.

Gubser, Nicholas J. — **The Nunamiut Eskimos, Hunters of Caribou.** New Haven, Yale University Press, 1965.

Harp, Elmer Jr. — The Archaeology of the Lower and Middle Thelon, NWT. Arctic Institute of North America. Technical Paper No. 8, 1961.

Honigmann, John J. — Eskimo Townsmen. Canadian Research Centre for Anthropology, 1965.

Houston, James A. — **Eskimo Prints.** Barre Publishers, Barre, Mass. 1967.

Iglauer, Edith — **The New People; the Eskimo's Journey Into Our Time.** Doubleday Publishers, 1966.

Jenness, Diamond — **People of the Twilight.** University of Chicago Press, 1959.

Kemp, William Barr — A regional analysis of economic, social and demographic changes among the Eskimo of the southern littoral of Hudson Straits, 1963.

Swinton, George — **Eskimo Sculpture.** McClelland and Stewart, Toronto, 1965.

## 9G–11.1 – MUNICIPALITIES


| | |
|---|---|
| Advisory Commission on the Development of Government in the Northwest Territories | Settlements of the Northwest Territories; descriptions, 1966. |
| Merrill, GL. | The New Aklavik: Search for the Site. **The Engineering Journal**, Jan. 1960. |
| Pritchard, Gordon B. | Inuvik – Canada's Arctic Town. **Canadian Geographical Journal**, June, 1962. |

## 9G–12.1 – TERRITORIAL GOVERNMENT


| | |
|---|---|
| Advisory Commission on the Development of Government in the Northwest Territories | Report of the Commission, 1966. |
| Department of Indian Affairs and Northern Development | Annual Report, 1968. |
| Northwest Territories | Annual Report of the Commissioner, 1968. |
| Rea, Kenneth J. | **The Political Economy of the Canadian North**; an interpretation of the course of development in the Northern Territories to the early 1960s. University of Toronto Press, 1968. |
| Yukon Territory | Annual Report of the Commissioner, 1968. |

## 9G–13.1 – COMMUNICATION

| | |
|---|---|
| Canadian Broadcasting Corporation | CBC Northern Service, **North**, July-Aug., 1962. |
| Trans-Canada Telephone System | A Study of Communications in Northern Canada, 1962. |

## 9G–14.1 – GEOGRAPHY AND CLIMATE


| | |
|---|---|
| Alexander, Scott E. | Cold Weather Clothing. **North**, Sept.-Oct., 1962. |
| Arctic Institute of North America | **The Arctic Basin.** Washington, 1963. |
| Dunbar, Moira and Greenaway, Keith R. | **Arctic Canada from the Air.** Queen's Printer, Ottawa, 1956. |
| Dyson, James L. | **The World of Ice.** New York, 1962. |
| Harrington, Richard | **The Face of the Arctic.** New York, 1952. |
| Hinds, Margery | **High Arctic Adventure.** Ryerson Press, Toronto, 1968. |
| Larsen, Henry A. | **The Big Ship**; an autobiography by Henry A. Larsen in cooperation with Frank R. Sheer and Edward Omholt-Jenson. McClelland and Stewart, Toronto, 1967. |
| Macdonald, R. St. J. | **The Arctic Frontier.** University of Toronto Press, 1966. |
| Mowat, Farley | **Canada North.** McClelland and Stewart, Toronto, 1967. |
| Mowat, Farley | Polar Passion; the Quest for the North Pole. McClelland and Stewart, Toronto, 1967. |
| Neatby, Leslie H. | **Conquest of the Last Frontier.** Ohio University Press, 1966. |
| Philipps, R.A.J. | **Canada's North.** Macmillan, Toronto, 1967. |
| Queen's Quarterly | **Focus on the North.** Winter, 1960. |
| Smith, I.N. | **The Unbelievable Land.** Queen's Printer, Ottawa, 1965. |

## 9G–14.1.1 – PERMAFROST


Brown, R.J.E. — Permafrost Map of Canada. Technical Paper 277, Division of Building Research, National Research Council of Canada, Ottawa, 1968.

Brown, R.J.E. — Permafrost and Related Engineering Problems, Technical Paper 173, Division of Building Research, National Research Council, Ottawa, 1964.

Brown, R.J.E. — Permafrost Investigations in British Columbia and the Yukon Territory. Technical Paper 253, Division of Building Research, National Research Council, 1968.

Johnston, G.H. — Pile Construction in Permafrost. Technical Paper 233, Division of Building Research, National Research Council, 1963.

Johnston, G.H. — Engineering Site Investigations in Permafrost Areas. Technical Paper 234, Division of Building Research, National Research Council, 1963.

Johnston, G.H. — Permafrost and Foundations. Canadian Building Digest, 64, National Research Council, 1965.

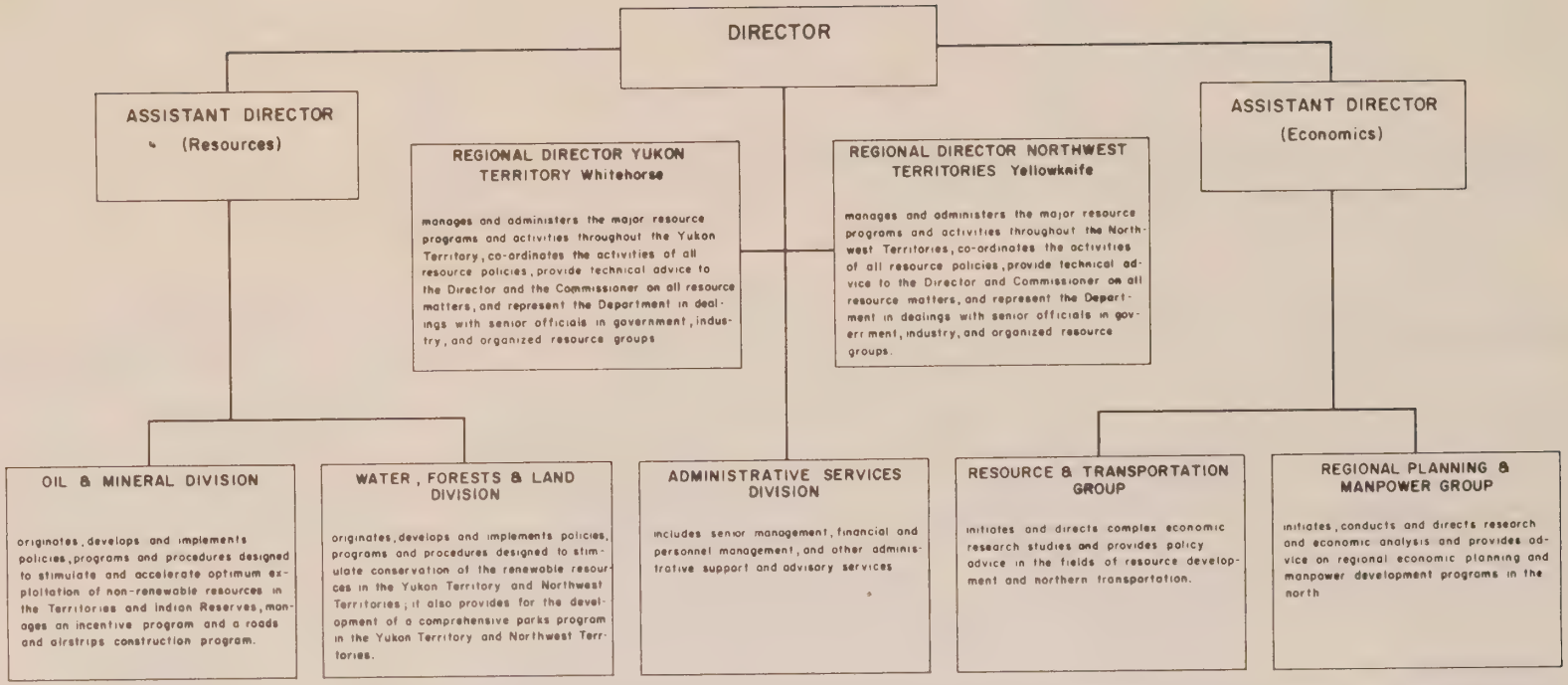
Legget, R.F. and Dickens, H.B. — Building In Northern Canada. Division of Building Research, National Research Council, 1959.

National Research Council — List of publications on permafrost and building in the North, Division of Building Research, 1968.

National Research Council — Permafrost and Buildings. Better Building Bulletin No. 5. Division of Building Research, National Research Council, 1955.

Platts, R.E. — Prefabrication in Canadian Housing. Technical Paper 172, Division of Building Research, National Research Council, 1964.

Platts, R.E. — The Angirraq; Low Cost Prefabrication in Arctic Houses. Technical Paper 236, Division of Building Research, National Research Council, 1966.




The Northern Economic Development Branch is responsible, on behalf of the Minister and the Federal Government, for the effective management of oil and gas, mineral, water, forests and land resources and for developing the economy of the Yukon Territory and Northwest Territories. Its tasks are to seek out and identify all means whereby the economy of the north can be expanded at a more rapid pace, to develop a broad plan of economic progress and to recommend (and in some instances, manage) specific projects and polices for achieving this objective.

The Branch has the concomitant responsibility for developing all minerals, including oil and gas, on Indian Reserves in the Provinces in order to generate employment, and revenue for Indians and Indian Bands, with as full participation of Indians as possible in the planning and execution of the development programs.

The type of northern development sought is of a general or balanced nature which will ensure that economic growth in the Yukon Territory and Northwest Territories will continue without the exclusive reliance on exploitation of non-renewable resources even though the exploitation of such resources at the moment forms the only substantial basis for rapid economic growth. It is only through the pursuit of such a policy that the population of the Yukon Territory and Northwest Territories can be assured continuing opportunities now and in the future.

It is considered that the key to any sort of rapid northern development lies primarily in the mining and oil and gas sectors but it is intended to use any success obtained in these sectors to create opportunities in other fields such as tourism, fish and game, hunting and related industries, taking advantage wherever possible of inter-sectional linkages. Accordingly, the Branch attempts to create the proper climate to attract more exploratory and development outlay on the part of private enterprise through exploration assistance programs, the Northern Roads Program, the Airstrip Assistance Program, together with specific support for railways and electric power.

The Branch further undertakes feasibility studies in such matters as smelters, townsite planning, power studies and other matters related to mineral resources development and in some instances, financial aid is given to bring these projects to reality.

It is believed appropriate to emphasize the existence of the very important responsibility of ensuring that every economic and resource development program provides the maximum opportunity for the employment of indigenous people in the area through co-operation with other appropriate arms of the Department and with all other relevant agencies of government.

# OIL & MINERAL DIVISION

Responsible for the management of oil and gas and mineral lands and rights in the Yukon Territory and Northwest Territories, the development and recommendation of policies to encourage and assist industry to exploit these resources, and the development and recommendation of policies relating to industrial and mining safety, as well as the administration of all statutes and policies related to the above.

Responsible for developing all minerals, including oil and gas, on Indian Reserves in the Provinces in order to generate employment and revenue for Indians and Indian Bands, with as full participation of Indians as possible in the planning and execution of the development programs.

Responsible for initiating, implementing and maintaining policies and development programs and projects designed to stimulate the exploration for major non-renewable resources in the Yukon Territory and Northwest Territories, conducts technical feasibility studies on a continuing basis relating to potential major resource development; advises on the relevancy and feasibility of Territorial road and airport construction and transportation generally.

## (INDIAN) MINERAL SECTION

in co-operation with Indian Band Councils and Advisory Councils, provide for the development and production of minerals on Indian Reserves in the provinces to ensure maximum revenue for Indian Bands; to train and provide experience for Indians in the management and development of their mineral resources, to train Indians for employment in the petroleum and mining industries.

- MINERALS ADMINISTRATION
- SUPERVISOR OF INDIAN MINERALS Calgary
  - Oil & Gas
  - Mining

## MINING SECTION

manages and administers minerals and mineral rights (excepting oil and gas) in the Yukon Territory and the Northwest Territories; encourages mineral exploration and development; initiates and administers safety legislation and ordinances in relation to mineral extraction industries

- GEOLOGICAL & EVALUATION UNIT
  - GEOLOGICAL EVALUATION Yellowknife
  - GEOLOGICAL EVALUATION Whitehorse
- MINING LANDS UNIT
  - N.W.T. Supervising Mining Recorder-Ottawa
  - Mining Recorder-Arctic & Hudson Bay-Ottawa
  - Mining Recorder Yellowknife
  - YUKON Supervising Mining Recorder-Whitehorse
  - Mining Recorder Dawson
  - Mining Recorder Watson Lake
  - Mining Recorder Mayo
- INSPECTION SERVICES UNIT
  - N.W.T. Inspection Services Yellowknife
  - YUKON Inspection Services Whitehorse

## OIL & GAS SECTION

administers oil and gas rights in the Yukon Territory and Northwest Territories, regulates, manages and encourages the production and development of oil and gas on these lands, protects the public interest, both in the disposition rights and in the introduction of adequate conservation measures.

- OIL & GAS LANDS UNIT
- GEOLOGICAL OPERATIONS UNIT
- GEOLOGICAL EVALUATION UNIT
- CONSERVATION UNIT Calgary

## DEVELOPMENT ANALYSIS

initiates, implements and maintains policies, development projects and an incentive program designed to stimulate the exploitation of major non-renewable resources in the Yukon Territory and Northwest Territories; conducts feasibility studies related to potential major resource development; advises on the relevancy and feasibility of Territorial road and airport construction and of transportation generally, administers the Northern Mineral Development Assistance Grants program.

- PROGRAM ADMINISTRATION
- ROADS & AIRSTRIPS

## WATER FORESTS & LAND DIVISION

Responsible for the protection, management and disposal of forest land in the Yukon Territory and the Northwest Territories and for the encouragement of the forest industry, together with the development of a comprehensive northern parks program in both Territories.

Responsible for northern water resources and for the development of appropriate water rights and water pollution control legislation; the initiation of speacial studies into hydro-electric generating and demand potential in both Territories, and in co-operation with other Federal Departments, to expand water resource investigations and data collecting networks

Responsible for the management and administration of Territorial lands, together with the residual Federal interests in public lands in southern Canada in order to bring such lands into maximum productive use.

### FORESTRY SECTION

manages and administers forest land in the Yukon and Northwest Territories by carrying out existing policies and recommending new policies to meet operating requirements; encourage forest utilization intensify the degree of forest fire protection and increase effectiveness of
ion by introducing protection priorities and developing cost-benefit ratios; develop a comprehensive northern Parks program in both Territories; plan, develop, administer and maintain the campground and roadside picnic sites in both Territories

#### YUKON FOREST SERVICE
Superintendant

#### RANGER STATIONS

Beaver Creek
Carmacks
Dawson
Mayo
Haines Junction
Teslin
Watson Lake
Whitehorse

#### N.W.T. FOREST SERVICE
Superintendant

#### RANGER STATIONS

Fort Liard
Fort Simpson
Fort Resolution
Hay River
Yellowknife
Rae
Snowdrift
Inuvik
Fort Norman

### WATER RESOURCES SECTION

develops and maintains an optimum "water" policy that will provide for the conservation and development of northern water resources by implementing appropriate water rights and water pollution control legislation and regulations by co-ordinating and, when necessary, initiating research investigations and special studies into all facets of northern "water" activities including the potential sites and present and future demands for hydro-electric power development, and based on the results of these studies, develop long-term planning programs to provide for the optimum development and utilization of these water resources.

### LAND MANAGEMENT

manages and administers dominion and public surface lands in the provinces; originates and develops policies respecting these lands; manages and administers land resources in the Yukon and Northwest Territories by implementing existing policies and recommending new policies to meet operating requirements and the expanding needs of the Territorial Governments particularly the alienation and leasing of land.

#### PUBLIC LAND

#### NORTHERN LAND

#### YUKON

#### N.W.T.

## ADMINISTRATIVE SERVICES DIVISION

Responsible the control and management of the financial and personnel resources of the Branch including preparation of the annual Program Review and Estimates submissions and for providing financial and management advisory services at Branch and Regional levels.

Responsible for advising senior Branch officers on the administrative implications of the resource and economic development policies as well as the implementation of such policies, and for directing and co-ordinating the development and implementation of long and short-term administrative and financial procedures designed to ensure effective utilization of all Branch resources.

Responsible for purchasing and distribution of all Branch supplies and equipment, the purchase and inventory of all capital equipment, co-ordinating the Branch promotional program including films, advertising, publications and displays, and providing all central office services such as drafting, stenographic and registry facilities.

### EMPLOYMENT LIAISON OFFICER (Resources)

Provides liaison between northern natural resources development industries and government departments and agencies responsible for the training and placement of northern residents in order to provide employment opportunities with particular emphasis on opportunities for Indians and Eskimos, negotiates special agreements for their employment and training in conjunction with negotiations for the provisions of special incentives under several departmental programs

### PROGRAM ASSISTANT (Economics)

initiates, plans and co-ordinates the administrative activities of the Economic Staff Group, provide administrative advice to the Assistant Director, Economics and to Senior Economists on financial, personnel and general administrative matters concerning the Group and the Branch

### ADMINISTRATION SECTION

manages and supervises the work of the Administration Section including purchase and distribution of office supplies and equipment, inventory of office and capital equipment, supervision of the work of the Pay and Benefits Unit which covers salaries, wages, and various financial deductions, supervises the personnel administration, and arranges for the provision of transcribing, typing and registry services

- STENOGRAPHIC UNIT
- PAY & BENEFITS UNIT

### DRAFTING SECTION

manages and supervises the work of the Branch Drafting Service, including drafting of original maps and charts, revising all current oil and gas, mining and economic maps and charts; producing a variety of drawings used in publications issued by the Branch, other branches and the department

- N.W.T. Yellowknife
- YUKON Whitehorse

### FINANCIAL SECTION

manages and supervises the work of the Financial Section including the implementation of the accounting and financial reporting systems, controlling and presenting the Branch's expenditures and revenues for Headquarters and the field; provide functional direction to field staff engaged in financial activities; and prepare financial statements and statistics on budgets, expenditure journals, program review and estimates submissions

- N.W.T. Fort Smith
- YUKON Whitehorse

## ECONOMIC STAFF GROUP

The Economic Staff Group functions to provide economic expertise and policy advice to senior Branch management and other Branches of the Department on matters concerning economic development. In addition to providing a capability within the Department as a whole in econometrics, operations research and other forms of economic analysis, the Division is to originate, develop and implement policies, programs and specific projects designed to accelerate economic development in the Yukon and Northwest Territories.

This includes ensuring that adequate statistics on all factors and segments indicative of the level of economic activity in the Territories are maintained in usable and readily accessible form; analyzing on a current basis economic indicators and producing assessments of economic trends in the Territories; developing policy recommendations and specific projects to expand all phases of the northern economy; undertaking broad and detailed economic studies for the purpose of establishing attainable economic objectives and long term plans.

### REGIONAL PLANNING AND MANPOWER GROUP

Initiates, conducts and directs research and economic analysis and provides advice on regional economic planning and manpower development programs in the north. In regional planning: directs studies and consideration of development of regions, particularly provision of service facilities needed such as education, recreation and retail trade, in regions as a whole, in existing centres or in new centres arising from resource development. In manpower development: initiates and directs research and surveys and economic analysis of alternative ways of developing the northern indigenous population to the point of being able to participate directly in the development both of the north and Canada as a whole.

- REGIONAL PLANNING SECTION
- MANPOWER SECTION

### RESOURCE AND TRANSPORTATION GROUP

Initiates and directs complex economic research and provides policy advice in the fields of resource development and northern transportation. Resources development: conducts studies and advises on the economics of northern non-renewable resource development projects; provides expertise and directs research as required on renewable resource matters in the Territories and northern national parks. In transportation: originates research and provides advice on transportation economics as related to planned or existing resource and industrial projects, including comparisons of modes of transport within specific regions or large areas; conducts studies and advises on technological developments in transportation as these might relate to planning and northern development.

- MINERAL RESOURCES SECTION
- FOREST RESOURCES SECTION
- TRANSPORTATION SECTION

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newsletter

northern economic
development branch
department of indian affairs
and northern development
government of canada